The Builder.

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National Provincial Bank of England, Worcester.....Messrs. Chas. Heathcote & Sons, Architects.
Interior, Hambleton Church.....Mr. John T. Lee, F.R.I.B.A., Architect.
Sketches in Spain.....By Mr. H. C. Brewer.

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Ideals in Art.

IF we judge only by the amount of artistic work or artistic effort going on among us at the present time, this should be, even in England, an artistic age. In France it really is so; though French art, as illustrated in sculpture and painting, is hardly in so healthy a state as it was some fifteen years ago. Still, there is in France an immense amount of artistic talent and energy, and there is a much more widespread feeling than in England in regard to the desirability of nourishing an artistic element in life. We see this in the obvious intention, in France, to treat necessary practical creations, such as railway stations, bridges, etc., in an architectural manner. We may not approve the manner always; we may think, for instance, that the pavilions which shelter the stairways to the underground railway in Paris are in a bad and restless form of *art nouveau*, but there is nevertheless the evidence that what was thought to be an artistic treatment was intended. And on a great scale there are the Orléans railway station and the Alexandre III. bridge as evidence. In England no one cares what the front of a railway station is like; or if a small minority do care, they cannot get anyone to attend to them. By dint of much speaking we have obtained that some artistic element should be put into our latest Thames bridge; but in the case of the Alexandre III. bridge no public criticism or contention was necessary to induce the authorities to aim at an artistic treatment; they called in the best artists as a matter of course, with the general approval of their public. In England a good deal of what was spent on that bridge would have been considered a sinful waste of public money.

Yet there was never a time when there were so many art-exhibitions as are to be seen in London at present—or at all events picture-exhibitions; an important distinction, since pictures do not include the whole of art. The tacit impression that they do is one of the popular fallacies of the day; and it is one which is practically countenanced by the Royal Academy, who make pictures the staple of their annual exhibitions, give a somewhat grudging place to sculpture, and leave decorative art and applied art almost unrecognised. In all this there is evidence of something wrong in our conception as to the real meaning of the word Art, and the real objects which it should aim at. Art does not consist in painting pictures, though painting pictures is a very important branch of Art. And in regard to pictures themselves, the ideas both of painters and of spectators need a great deal of winnowing. How many pictures are painted and exhibited every year which add nothing to art in the true sense of the word; which represent only what may be called an acquired sleight of hand in imitating the appearances of things—acquired not without hard and severe study, it is true; but a study the results of which are of little importance or significance. And how many of those go round our annual picture-gallery shows really know what they want or what they ought to want from a picture-exhibition?

The two sides of the subject—what goes to make a general artistic atmosphere (so to speak) in a country, and what should be the aims of the particular art of painting, are considered respectively in two books recently published, one by an eminent decorative artist,* the other by an eminent painter.† The scope of neither book is quite accurately represented by its title. Mr. Crane's should rather have been called, perhaps, "Artistic Ideals in Life," or some such title, indicating the real range of the book, which is to suggest how our daily life may be more permeated with artistic sympathies and more fitted for artistic production; and Mr. Clausen's book should certainly have been entitled "Aims and Ideals in Painting," as, with the exception of one or two illustrations from antique sculpture, it is with painting that he almost exclusively deals, and it is a pity to use a title calculated to confirm people in the prevalent belief that art means pictures. Both books, however, contain much that is valuable.

Mr. Crane's book consists of papers read on various occasions; but there is sufficient unity in its main object:

* "Ideals in Art:" Papers theoretical; practical; critical. By Walter Crane. London: Geo. Bell & Sons. 1905.

† "Aims and Ideals in Art:" Eight lectures delivered to the students of the Royal Academy. By George Clausen, A.R.A., R.W.S. London: Methuen & Co.

All of them touch in one or another form on that gospel of art which Morris was the first to preach to an unwilling generation, viz.: that art consists in the first instance in a desire and endeavour to beautify the things of ordinary use. "Is Art," as the author asks in the chapter on "The Teaching of Art"—"a mere imitative impulse, a record of the superficial facts and phases of nature in a particular medium? Or is it the most subtle and expressive of languages, taking all manner of rich and varied forms in all sorts of materials, under the paramount influence of the selective search for beauty?" The latter is obviously intended to be the sound conclusion, though the author does not wish to ignore the former altogether. But in developing his idea as to the Teaching of art (as far as he admits that it can be taught), the position taken is that the study of the art of *design* should come first. "Before we can have art we must have sensibility to beauty, and before we can have either we must have conditions which favour their existence and growth. We must have an atmosphere." And this is why the study of abstract design in form, and based on architecture, is recommended, as the means of evolving and stimulating the sense of beauty in design, independent of mere imitation. Mr. Crane wishes his student to understand that it is one thing to make an accurate presentment of a figure or other object, and quite another to make them into organic pieces of decoration to fit a given space: with which we entirely agree. When he goes on to argue, however, that a purely pictorial training which may end in failure to produce sufficiently successful pictures, does nothing to fit the student for other fields of art, and leaves him before the simplest problem of designing helpless and ignorant, then we should say that his pictorial training has been bad. Painters who have made a real success in pictorial work have always paid a great deal of attention to lines of composition: as an eminent landscape-painter remarked to us one day, "We are as careful of our lines of pattern in a landscape as you architects are in a decorative design"; which may be a little exaggeration, but certainly pictorial work, whether of figures or landscape, does include the notion of design, if not exactly in a decorative sense (as the word "decorative" is usually understood), at all events in the sense of balance of line and of light and dark masses. To say, as Mr. Crane does on another page, that the cabinet or "competitive" gallery picture has destroyed painting as an art of design, is a statement we cannot accept. Pictorial work, in its best form, is design with something else superadded: what that is we will consider just now. Mr. Crane wants everything to be studied in relation to something else; he criticises the Life School Study of the Academy as only "the study of the human frame as isolated from everything else." But the human frame itself is enough matter for study in the first place. The student has to know that thoroughly first; when he does, he can be at liberty to consider its treatment in composition—either in the free composition of pictorial work, or in the more bounded and conventional composition of purely decorative work. But accurate and complete knowledge of the figure comes first. Study of design will not bring that.

Among the subjects on which Mr. Crane touches in regard to the art of common things we may mention two. One is, in regard to the ugliness and monotony of small houses for the poorer class—"small brick boxes with slate lids, packed together in straight rows." He suggests that the collective dwelling, "of which we perhaps see the germ in the better type of modern flats," may have an important future; and he gives a plan and elevations by his son, Mr. Lionel F. Crane, who is an architect, showing a collection of cottage homes around an arcaded cloister, with a green and a fountain in the centre, and a common dining-hall and reading-room occupying one side of the quadrangle. A kitchen and baths wing projects out from one angle of the parallelogram. The idea is well worth consideration. Whether the poorer class would really like a common dining-hall in preference to the family meal in the small room may be doubtful; there is no doubt, however, that it would be better for them hygienically. The other point is in regard to dress. His sketches of simple but picturesque dress for women and children are very pretty; though Mr. Crane admits that ladies' dress is at present, for the most part, artistic; but he objects (with reason) that it is so subject to the mere influence of fashion, and does not arise out of the deliberate choice of the beautiful. The dress of the modern gentleman he considers hopeless. We have to go for the picturesque to the peasants' and artisans' dress (he gives sketches of a fisherman and a navvy); a dress for utility generally comes out more or less picturesque; even the modern gentleman's dress becomes picturesque when he dresses for athletics—for use and not for show. "If we lived simple useful and beautiful lives, we could not help being picturesque in the highest sense." Mr. Crane gives an amusing sketch (reminding one of Pugin's "Contrasts" in architecture) of a gentleman in the present-day evening-dress contrasted with one of the XIVth century. He has rather made the worst (one is tempted to do so in such cases) of the modern gentleman, making him look like a fool, which is not a necessary part of the programme. But it must be remembered that the ideal of the gentleman in modern society includes a feeling in favour of a certain reserve and quietude of manner, which is at variance with and would not be expressed by any special picturesqueness of costume. There may be too much of this reserve; but that is our way of life now, and the dress expresses it, as the XIVth century gentleman's dress expressed his life, which was by no means so respectable as ours. And then there is a great deal in association; what we see every day becomes commonplace to us. It may not appear so commonplace to writers on art three hundred years hence. The tall hat has lasted so persistently that it seems to answer to some demand in modern life; probably the secret is that there is a certain dignity of demeanour inseparable from it. However, we are not defending it, only suggesting the possible reason for its hold on our tastes. We do not think modern evening dress as bad as Mr. Crane does. It is reserved and dignified. What it wants is a little colour—embroidered waistcoats, for instance, which might very well be combined with it, and the substitution of knee-breeches and stockings for the shapeless trouser-leg. But even as it is we do not think it deserves all that is said against it.

Among Mr. Crane's ideals as to the conditions of art is evidently Socialism, though the word is not used. "Is it wonderful that monopoly in art should follow monopoly of land and the means of subsistence?" We doubt if such theories lead anywhere. History shows no rule on the subject. A free people like the Greeks had a great art: an aristocratic and tyrannous epoch like that of Renaissance, a period too of almost abnormal wickedness and licence, had great art also. There is no systematic and necessary connexion between art and ethics. It is probable that early Republican Rome was a very inartistic community; the best of Roman art was developed under the Empire. Therefore the pages in Mr. Crane's book devoted to "the social and ethical bearings of art" we do not find very convincing. The ideals here are too ideal. The theory of life and art set forth seems a beautiful and complete one, but it has often been falsified in history, and there is no proof that it can be realised now. What is true in the author's view is the ideal of a condition of life in which there should be a general desire and aim to make common and every-day things beautiful. On this he has much to say that is true and valuable. There was a time in England, during the mediæval period, and even during the early Renaissance or transition which we call the Jacobean period, when this was so, when there seem to have been no ugly things made: What has killed it? There is something in the idea that it is the surviving influence of the Puritan rule, but that cannot explain it altogether. Even in the Queen Anne period, when unquestionably there were ugly churches, there was beautiful silver work and interior house decoration: not rich with the richness and luxuriant beauty of the Italian Renaissance, but almost perfect in good taste. Where had the good taste vanished to in the earlier part of the XIXth century? In the Queen Anne period there was silver that was ornamental without meaning to be so; in the Victorian period there was silver that meant to be ornamental and was hideous. The explanation of it lies deeper than in forms of government or the condition of the poor. It is doubtful whether it can be explained at all on any general theory of the relation of life and art. But we can see that it is true, as Mr. Crane points out, that there is an entire change of spirit from the time when all the arts of design were centred in architecture, to the time when, as now, art has become so much more a personal and individual work.

That is the author's complaint, but surely there is a great interest in this individualism. And in the most intellectual forms of art it is inevitable. It is the same with music. With the music of the people in an early period of the art, there was a Folk-music which had its

national character, and seemed to be a spontaneous growth. But when the great composers came, each had his own personal style, as each of the great painters in the later Renaissance had his own personal style, and can be recognised by it. And it is here that we part company fom Mr. Crane. We quite agree with all he says as to the need of a general feeling for the beautiful in the everyday things of life, but we must recognise that there is a higher form of art which rises above the everyday things; and it is here that personal genius and temperament come in. The industrial and applied arts are all relative; they are connected with the use of an article, and are influenced, or should be, by the material of which they are made. Mr. Crane wants all art to be "relative." He thinks the gallery picture, unrelated to anything but itself, "has destroyed painting as an art of design." As already remarked, the best painters, even of landscapes, pay much attention to composition of line. But the fact is that painting in its highest and most intellectual development is something *more* than an "art of design." We quite agree with the author in the remark, in the chapter on "The relation of the easel picture to decorative art," that "mural feeling" in a picture includes "a certain flatness of treatment with choice of simple planes and pure and low-toned colours, together with a certain ornamental dignity or architectural feeling in the structure of forms and lines of composition"; all this is perfectly true, and we agree with it entirely; but then he has to conclude—"and is generally antithetic to accidental or superficial characteristics or what might be called landscape effects." Exactly: but what does that come to? To this: that every picture treated relatively to something else, must give up something of its own intensity and completeness. But then what is to become of Titian, and Velasquez, and Turner, perhaps the three greatest names in easel-painting? You can never reduce them to relativity; they are far too intensely alive. Are we to give them up? And the argument applies to many other painters; to all who have original genius enough to put their own life and originality into their own creations, whether of figure pictures or of landscape.

No: all this depreciation of the easel picture, because it is "relative" to nothing, is a mistake. We do not say that there is any gulf fixed between applied art and personal art; the one leads by steps up to the other; but no theorising will ever persuade us that decorative design is a matter of equal intellectual interest with a pictorial creation of the highest class, or that the latter has not a right to be studied and admired for itself alone, apart from any question of its relation to its surrounding. Painting in its highest form is an intellectual art in a sense in which decoration is not, and takes its stand on pretty much the same level as poetry. A great picture is a poem addressed to the intellect through form and colour, and is to be judged on its own merits and not in relation to its surroundings. And what goes to make a great picture? There we come on the subject of Mr. Clausen's book, to which we will return in another article.

THE PRESERVATION OF CASTLES IN GERMANY.

WE have received from Herr Bodo Ebhardt, whom some of our readers will remember as one of the most eminent of our foreign visitors at the recent Architectural Congress, a copy of an interesting paper on the mediæval civil architecture of Germany, especially in regard to the preservation and to some extent restoration of her ancient castles. On this latter subject Herr Ebhardt possesses a great deal of special knowledge, and has been commissioned by the German Emperor to undertake the study and the preservation of some of the most important of the mediæval castles of Germany.

Herr Ebhardt, in the paper referred to, points out how impossible it is to overrate the important position which is held by castles in the study of the architecture of that period. The remains of mediæval castles are the oldest witnesses of civil buildings which early centuries can produce; they date mostly from a period which otherwise can offer us none other than ecclesiastical remains; and in Germany, at any rate, the ruins of these splendid structures testify to a development of stone construction which reached a far higher standard of perfection than is usually admitted.

The care of ancient castles has for long been recognised in Germany as a necessity. Only the impetus was wanting to give practical expression to the universal wish of preserving the thousands of splendid remains, interesting both historically and artistically, that are scattered over the land. Six years ago a handful of eager spirits founded what they styled "The Society for the Preservation of German Castles"; and so active has it been that it has thoroughly awakened the public conscience, and to-day in German circles the preservation of ruinous castles is considered an unquestionable duty. Even municipal authority is ready to aid and abet the movement, as is illustrated by the action recently taken with regard to Wartburg Castle, the crown of all Thuringia, and the most prominent feature in the landscape of Eisenach. In order that it may ever retain its dominating character, a blue line has been drawn on the map of the locality, which line limits the height of the buildings erected in its neighbourhood. Unfortunately, however, legislation on the matter is still far from complete, and municipal interference may hasten on destruction instead of averting it, as in the case of the Bavarian castle of Elmstein. Elmstein was one of the oldest possessions of the Counts of the Palatinate: the earliest reference to it is in records dating from 1212. The District Council recently ordered the present owner to repair certain cracks of long standing, in the ramparts, but this gentleman, rather than incur the expense entailed, ignored the order. Two weeks later he was fined by the Sheriff's Court the sum of 1 mark (1 shilling) for disregarding the order, and "for not removing the ruin." The ruin has since been "removed" for the value of its building material.

The original band of thirty members of the Society has swelled to 700, drawn from all classes and professions, from Duke Ernst Günther of Schleswig-Holstein to hotel-keepers. Not only do the members display remarkable activity in attending the meetings, following the works and assisting in the execution of arrangements planned by the Society, but the Emperor has shown his approval of the work by attending some of the public meetings where papers of special interest were read. He has further acknowledged the Society by presenting to it the Crown property of Marksburg. This is one of the oldest but best-preserved castles on the Rhine, which was long used as a prison, and consequently was much defaced and patched up. The Society has been engaged in restoring the whole building to its original form, turning part of it into a museum and library, to which members present pictures, arms, furniture, books, etc. The enterprise is proving a financial success, in that the number of visitors has risen from 300 in previous years to 12,000 in the past year.

The Society was founded in March, 1899, with the object, first, of preserving German castles as monuments of national history and art; second, of inquiring into the historical and artistic origin of German castles, and by means of its journal, *Der Burgwart* (Care of Castles), publishing such knowledge for the public benefit. In order to compass its end, the Society undertakes to give advice and assistance to existing societies which have the care of isolated districts or particular buildings, to found new local societies when it is deemed advisable to keep a watchful eye on any ruin, to hold meetings and read papers for the benefit of the public, to support a private journal, to review literary works bearing on the subject in hand, as well as to report on the activity of the Press in such matters; to form a collection of sculpture, books, objects of art, etc.; to report on the changes occuring in the ownership or buildings of German castles; to assist with advice and money individual owners who require help in order to preserve their castles from ruin, and to acquire by purchase or gift such castles whose condition demands this, and which would prove serviceable to the Society.

Such is the programme laid out for itself by this energetic body, and that it is not mere talk is proved by the records kept by *Der Burgwart*. Each number of this monthly journal contains two short articles, illustrated by numerous plans and views, on any two castles which show particular points of interest. In the limited space allotted for each article the building cannot be dealt with exhaustively, but just so much is outlined of its origin and history, its legends hinted at, its past and present state commented on, as to arouse the interest of the reader, and to awaken his desire to see the place and pursue investigations, or to give pecuniary assistance in the work of restoration. Castles in every state of preservation are considered of equal interest, whether they be still inhabited, like Tenneberg Castle, Thuringia, which is of such remote antiquity that its founder cannot be traced, or whether their ruins lie, like the Silesian castle of Zobten, a foot below the soil.

Under the heading "Structures in Danger" are catalogued castles which have attracted the notice of members,

and which may yet be saved from total ruin or deliberate destruction, such as the fine keep of Neu-Blankenheim, which the owner proposed selling to a contractor whose intention it was to level the ruins and build a saw-mill on the site. That these warnings bear fruit is illustrated by the fate of Auerbach Castle. The owner proposed pulling down the 10 ft. high remains of an XIth century circular tower, in excellent preservation, in order to erect a villa on the spot. As such another tower is not to be found in Saxony, the *Burgwart*, ever watchful, published this proposal, with the result that the necessary steps were taken to prevent the owner from committing this act of vandalism. But such measures cannot always be taken in time, and tales are not wanting of reckless demolition such as was perpetrated at Altona Castle, Schüttorf. The castle had been recently bought by a banker, who, for motives of safety, took down the greater part of "the tottering walls." The only way in which these tottering walls could be induced to fall was by blasting them steadily for five days with dynamite.

Under the heading "Reconstructions" one finds much instructive and interesting reading. Those castles are catalogued that are undergoing repair, and advice is offered in a friendly way, when the plans or methods adopted are open to criticism. For instance, the proposed alterations to Castle Elsterberg, partly undertaken by the State, are strongly objected to, and the free use of iron ties and cement coping condemned as harmful in the end to the building, and unworthy makeshifts for a State to resort to. This poor work is the result of the practice, unfortunately very common in Germany, of saving architects' fees by leaving the work of restoration to builders. It is pointed out, as a general principle, that the first care should be to retain the original *form* of a monument, and that the next most important point is the *material*. Repairs are generally delayed so long that the original outer skin has too often to be removed and replaced by new material.

Not only advice but pecuniary aid is given when a case is urgent. In 1902, when the Association was only in its fourth year, and consequently not overburdened with funds, it gave 8,000 marks towards various restorations. As it is not in a position to assist all deserving cases, the Society appeals eloquently to the State to come forward and help impecunious owners who cannot, and should not be expected, to bear alone the expense of preserving for posterity their costly national inheritances.

EXTENSION OF TRAINING COLLEGE, PRESTWICH, SALFORD.—Salford College, which is situate on a site in Sedgley Park, and is used for the training of female teachers for the Catholic elementary schools, has been enlarged by the erection of an annexe. In the basement of the new structure are the students' common-room, an assembly-room, about 80 ft. by 40 ft., to seat about 250 persons, a lecture-room, with the seats arranged in tiers, and a physical and chemical laboratory. The ground floor is occupied by three classrooms, an art-room, the principal's apartment, dining-room, and pantry. A corridor, with tiled floor and dado, runs down the middle, 120 ft. long and 13 ft. wide. Upstairs are the three dormitories, divided into separate cubicles. The contractors were Messrs. Neill & Sons, and the architect was Mr. Oswald Hill, of Manchester. The cost of the extension has been 10,000*l*.

NOTES.

The Thames Ocean Wharf Project.

SINCE the publication of our "Note" on March 11 last year the scheme for the construction of extensive wharves, transit sheds, and incidental works near Greenhithe has begun to assume practical shape. Therefore the time is appropriate for a word of protest against the announced intention to build the wharves entirely of timber. Disastrous fires on the Thames, in New York Harbour, in Antwerp Docks, and elsewhere have sufficiently proved the undesirability of timber for the construction of wharves, quays, and sheds; and practical experience shows how liable it is in all tidal waters to injury by sea worms and decay. In view of the satisfactory results given by concrete-steel wharves and jetties on the Thames and in various harbours of the United Kingdom, we are somewhat surprised that an engineer of such repute as Sir John Wolfe Barry should allow his name to be associated with the proposal to construct these important works of a material whose inferiority is now generally admitted.

Trade Effluents and Public Sewers.

THE *Times* on the 19th inst. stated that the Local Government Board in connexion with the amendment of the Public Health Acts was considering the advisability of establishing a Central Board capable of acting as referees or arbitrators in matters in dispute between manufacturers and the local authorities arising out of the discharge of trade effluents into public sewers. The *Times* points out that the Police and Sanitary Committee recently presented a report to the House of Commons recommending that steps should be taken to carry out the recommendations of the Royal Commission on Sewage Disposal in the third interim report, which was presented so long ago as March, 1903, which recommended the establishment of a central authority. It appears, however, that there is some difference of opinion in various parts of the country as to whether the manufacturers should be allowed the use of the sewers subject to previous treatment of the effluent by the manufacturers, relief being given in exceptional cases from treatment of the effluent on payment of a special contribution (the course recommended by the Royal Commission), or whether the special charge should be the rule, and the manufacturers should be relieved from treating the effluent. Whichever of these two views be adopted there appears to be little doubt that uniformity in practice is most desirable, and that the difficult questions likely to arise in connexion with this subject should be determined as expeditiously and economically as possible.

Builders and Workmen's Compensation.

A CURIOUS contention was raised in the case of Greenwood *v.* Hawkings, an action for indemnity for compensation paid under the Workmen's Compensation Act, 1897. The plaintiffs in the action were the undertakers of the building work at the Guildhall Tavern, Kingstreet, the defendants were sub-contractors, who had undertaken the carving work on the stone of the building. One of the defendant's men was killed in the operations, and the plaintiffs had, under sect. 4 of the Workmen's Compensation Act, been proceeded against by the man's dependants for compensation, and now claimed the amount paid as compensation, and the costs of the arbitration from the defendants. The defendants had been selected by the architect to do the work, and they contended that their contract was not with the plaintiff but with the architect. A letter had been sent by the plaintiff to the defendant which contained the following passage: "Execute the whole of the carving. . . . You agree in accepting this order to sign and send by return of post the enclosed accident indemnity." This indemnity was an undertaking to indemnify the plaintiff from claims made by the defendant's workmen under the Workmen's Compensation Act. The defendants did not sign and return the form of indemnity, but they proceeded to carry out the work. The judge held that by thus proceeding with the work they had tacitly assented to the terms of the contract and had entered into contractual relations with the plaintiffs. A second contention was that the accident had been caused by the negligence of the plaintiffs themselves in the lighting and fencing, but this was also negatived, and the plaintiff recovered the compensation paid and costs incurred. The indemnity offered to the defendant to sign seems to have been directed to avoiding the difficulties experienced in construing sect. 4 of the Act. By that section the undertakers are entitled to be indemnified by their sub-ordinates; but its language has caused some difficulties. In this case it would appear there would have been no difficulty in claiming indemnity under the section, apart from the contract, but the point on which the latter became material was whether such a contract existed between the parties as to make the section apply.

Fire Risks in Parish Churches.

IN a letter to the *Times*, Mr. Eustace Balfour directs further attention to the necessity of providing fire-extinguishing apparatus in parish churches. His experience is that the average village church is totally unprovided with means for preventing damage by fire—a state of things suggesting neglect of an obvious duty rather than praiseworthy trust in Providence. The cost of the necessary appliances is not heavy, and we feel sure would be defrayed by the inhabitants of parishes containing historic churches, or even modern ecclesiastical buildings. As Mr. Balfour points out, the problem of water supply may be variable, but can always be solved in satisfactory manner. Mr. Balfour's description of organ construction must not be read too literally. An organ is by no means "entirely of wood, in thin pieces"; metal pipes are far more numerous than those of wood; metal is employed for various mechanical movements, and much of the wood is in fairly thick pieces. Still, as stated in our "Note" of November 17th, the construction is highly inflammable, and naked lights ought to be strictly prohibited. A useful suggestion by Mr. Thackeray Turner, is that electric torches should be substituted for the customary

candle, and we may add that compact forms of portable electric hand lamps with accumulators—such as are used in mines, factories, and ships—can now be obtained, giving a 6 c.-p. light for upwards of fourteen hours. These provide a perfectly safe alternative to the candle for all places where electricity is not otherwise available.

Motor Omnibuses and Noise.

AT the dinner of the Motor Union, held last week to celebrate the tenth anniversary of the Act legalising motor-cars, Sir Edward Henry, in responding on behalf of the police, made an interesting statement in connexion with motor omnibuses. He stated that draft regulations had been drawn up and had received the approval of the omnibus owners, with the exception of that provision which provided that the machinery must not make "undue noise." What amounted to "undue noise," Sir Edward observed, had given rise to some contention, because there was no fixed standard by which noise could be estimated, and it depended on the hearing, nerves, and opinion of the individual; but he intimated that an eminent scientist in connexion with Lord Rayleigh was considering the possibility of inventing a machine to standardise noise. Noise, however, as has been proved in connexion with sound signals from lighthouses, varies considerably with both atmospheric conditions and the immediate surroundings of the object which emits the noise. London streets are peculiarly resonant, and noise is often more apparent from the upper stories of the houses than on the ground floors. Machinery also is capable of being worked noisily, and mechanicians, if once their omnibuses had passed the standard, might become careless in the subsequent working.

Liabilities of Motor-Car Owners.

THE case of Du Cros *v.* Lambourne, recently decided by a Divisional Court, is one of considerable importance on motor-car law. The appellant was the owner of a powerful motor-car, and was also a duly licensed driver. He was summoned for driving to the danger of the public at a speed of about 50 miles an hour. At the time in question a lady was occupying one of the front seats in the car, who also was a licensed driver. There was a conflict of evidence as to whether the appellant or this lady was driving the car: The justices, without determining this issue, had convicted the appellant on the ground that if he was not driving himself, as an experienced driver of motor-cars he must have known that the speed the car was travelling was dangerous to the public, and should have prevented the lady from so driving—in other words, that he was aiding and abetting the offence. The Divisional Court have upheld the conviction, and laid it down that the person aiding and abetting can be charged with the principal offence. This being the law, it would appear that in future owners who are experienced drivers will no longer be able to allow their chauffeurs to drive to the danger of the public without themselves being amenable to the law. Since the above decision was delivered the Motor Union, at the recent conference, have intimated that no objection should be raised to a change in the law making an owner liable for abetting. The decision in this case apparently had not been brought to their notice.

Damages for Causing Subsidence in Highways.

THE case of Mayor, etc., of Wednesbury, *v.* Lodge Holes Colliery Company, commented upon by us December 16 last, has been carried to the Court of Appeal, where the decision has been reversed. The question was simply what was the measure of damages against the defendant, for having caused subsidence in a road vested in the plaintiffs by virtue of sect. 149 of the Public Health Act, 1875, by reason of the defendants' mining operations. The plaintiffs claimed 400*l*., which was admitted to be a reasonable sum if the road had to be restored to its original levels, but the defendants contended that it could be made as commodious for the public as it was before for 80*l*., and they paid this sum into court, and the judge of the court below had accepted the defendants' view, and given judgment for them. This view excluded the risk of continued subsidence, and limited the powers of the plaintiffs to merely maintaining the roadway as a road. The Court of Appeal, in considered judgments, have reversed this finding, and the effect of the decision is this, that the public authority as trustees for the public were entitled to have regard to all the rights and amenities of the highway, nay, were bound to do so, and that as they had acted on competent expert advice in restoring the road to its old level, they had acted reasonably in accordance with their statutory duties, and the defendants, as wrongdoers, were liable in damages for the cost of carrying out the work.

Projections over Pavements.

THE Liverpool Improvement Act, 1882, enacts that "It shall not be lawful without the written consent of the Corporation to construct, place, fix, or hang any . . . sign . . . so as to project over the surface of any street at any time, or so as to allow any suspended load to hang over the surface of the street at any time." In the recent case of Goldstraw *v.* Jones, an iron pole to support a flag or advertisement was placed through an open window, bolted to the building by a screw bolt and nut, 20 ft. above the street level, and projecting 6 ft. beyond the building-line. This pole had to be removed whenever it was required to shut the window. The magistrate considered that this projection was not of such a fixed and permanent character as to come within the terms of the section, but the Divisional Court have held this to be a "sign."

A New Point for Boiler Owners.

AS THE result of the Board of Trade inquiry into the boiler explosion at Cradley Heath in July last the Commissioners stated a principle that may come as a surprise to many owners of steam boilers. The boilers to which we here refer had been duly insured and regularly examined by the inspectors of the insurance company. The Commissioners found, however, that the examinations were "loose and unsatisfactory," and characterised as "a pure invention" the certificate, signed by the chief assistant engineer to the company, to the effect that the boiler was in order, and that it had been properly prepared for examination. Moreover, they decided against the view that the boiler owners "could escape liability by having an annual inspection of their boilers only by an inspector of an insurance company." This point ought to be noted by architects who instal steam generating plant, and are not infrequently expected to give their clients some hints on the questions of insurance and inspection.

Electric Machinery.

PROFESSOR J. EPSTEIN, of Frankfort, read an interesting paper on the "Selection and Testing of Materials for the Construction of Electric Machinery" to the Institution of Electrical Engineers this week. So many qualities—electrical, thermal, and mechanical—of materials have to be considered when judging their relative values for electrical work, that it is exceedingly difficult to lay down any general rules as a guide for the manufacturer. We think that Professor Epstein's advice to engineers not to lay too much stress on those qualities of bodies which can be easily measured to the neglect of other qualities which are of equal or even greater importance in practical work, was both timely and valuable. His account of the standard German methods will be useful, and may possibly lead to some changes in the everyday practice in this country. The diagrams illustrating the progressive deterioration or the "ageing" of some of the qualities of the iron sheets used for field magnets and transformers are valuable, as they show the magnitude of this effect, but no hint is given of the treatment by which several English manufacturers prevent this "ageing." The method described of testing the micanite tubes used for insulating the armature conductors used in high-pressure machines was not very convincing. It is not obvious that the heating effect is due to "dielectric hysteresis." Many simpler explanations might be given. In the paper, laboratory tests are occasionally disparaged when compared with workshop tests. It is stated also that the values deduced by empirical formulæ from the experimental data obtained by tests on similar machines previously constructed are often notably different from those deduced from "theoretical considerations." We think that both these statements are apt to produce erroneous impressions as to the value of laboratory tests and theory. The results obtained by careful laboratory tests are rigorous. Errors arise when engineers apply these results to cases where the forces acting are measured wrongly, or when they leave some of them out of account altogether. In these cases "theory" and "laboratory" tests are blamed. One or both of these may be faulty, but a much simpler explanation often suffices.

The Cement Industry.

IN a lengthy paper on "Recent Progress in the Cement Industry," recently communicated to the Society of Chemical Industry, Mr. Bertram Blount discusses

many of the problems which are at the present time occupying the attention of cement makers. Mr. Blount thinks that in the future Portland cement will be made by fusing the unground raw materials in a furnace, from which it will be tapped while liquid. The fused material will be granulated by air or steam so that it may be readily ground. Many cement makers will refuse to follow Mr. Blount in his forecast, which would include the obsolescence of rotary kilns and grinding machinery for the raw materials, but his speculations are scientifically sound and merit careful consideration. With reference to Dr. Passow's method of making slag cement, about which so much has been heard lately, Mr. Blount says that although he was at first sceptical about the quality of the cement, he now admits, after investigation of the process, that "it is practicable to prepare hydraulic cement of great strength from suitable blast furnace slag by the regulated cooling of the slag while solidifying." In the discussion much divergence of opinion was revealed on the subject of wet *versus* dry mixing of the raw materials for cement making. Mr. Spoor said that Edison's rotary kiln at Stewartsville used with a dry process consumes less than 17 per cent. of fuel, and this is the best record of the world. The kiln is 150 ft. long, and makes 1,000 tons of cement per week.

Geffery's Almshouses, Shoreditch.

THE Society for the Protection of Ancient Buildings, the National Trust, and the Metropolitan Public Gardens Association have addressed a memorial to the Charity Commissioners against the proposed sale of the site and materials of the almshouses in Kingsland-road, Shoreditch. The records of the Ironmongers' Company show that in 1703 Sir Robert Gefferys, or Geffrey, bequeathed to them, in trust, all of his estate, a few legacies to some relatives excepted, to be converted into money and to be laid out in the purchase of ground for an almshouse for so many as the rents and proceeds—each inmate to receive 6*l.* per annum and 15*s.* for a gown—would support. The Ironmongers' Company bought a parcel of ground at the corner of Pearson-street in Kingsland-road, and built on it fourteen houses and a chapel. Some years ago the real and personal estate of the charity yielded a total income of nearly 1,700*l.* per annum. The charity had meanwhile been augmented by means of a bequest in trust of 3,500*l.* Consols, under the will (July, 1846) of William Wild, whereby the Company became enabled to add about 93*l.* yearly to the pensions paid to the almspeople. The memorialists direct attention to the typical character of the almshouses, which retain the architectural charm of buildings of the period. They urge that their destruction would break a valuable link in the chain of the domestic history of London, and remove a standing example of the charity and benevolence of her citizens. The buildings were lately re-roofed, the chapel has been newly decorated; in front of the houses is a large garden containing some fine trees. The whole place, indeed, affords one of the few remaining examples of the many similar institutions which in the course of the XVIIth and XVIIIth centuries were established in this and other parts of East and North-East London, forming a homely and pleasing feature in localities which at that time constituted nearer suburbs of the town.

The Fine Art Society.

ALL our readers who have admired the fine and original drawings which the late H. W. Brewer for so many years contributed to the *Builder*, will be interested to learn that his son, Mr. H. C. Brewer, inherits some of his talent in the pictorial representation of architecture, and has now on view at the Fine Art Society a collection of sixty water-colours of subjects in Spain, chiefly architectural. Among our lithograph plates this week we have given small reproductions of five of these drawings, which are exhibited under the general title "The Cities of Spain," though among them there are also a few studies of the arid stony landscape of the country. The architectural subjects include representations of a great many of the most remarkable of the mediæval monuments of Spain, at Burgos, Toledo, Segovia, Cordova, etc., and the buildings are pourtrayed with a great feeling for colour and poetry of effect. We hope those of our readers who admired the late Mr. Brewer's drawings will go and see the work of his son. In the same gallery is a collection of "Water-colours in Devon and Cornwall" by Mr. S. J. Lamorna Birch. Though rather wanting in purity of colour, there is a great deal of effective work in these drawings, of which perhaps the best is "The Last Long Streaks of Snow" (86), which is in a broader style than most of them. Among others that we were struck with are the grey sea in "The Foot of Carn Bargis" (63); "The Gloaming" (66); and "Solitude" (115). Miss Eulabee Dix's portrait miniatures, in the same gallery, are very good examples of a form of art which does not attract us very much.

The New English Art Club.

THE early numbers in the catalogue of the New English Art Club (which again exhibits in the gallery at the back of Deringyard, Bond-street) are rather reassuring. Mr. A. W. Rich, whose landscape sketches used to be too defiantly untidy, has reformed in this respect, and his small landscape studies on toned paper, Nos. 1, 15, 23, and 32, are very interesting, No. 15 very much reminding one of De Wint. Mr. Orpen's two pencil sketches of mother and child (7 and 11) are very good, and Mr. Muirhead Bone has made an interesting small picture of "The Great Gantry, Charing Cross Station" (16), a rather unusual subject. It is when we come round the corner to the oil paintings that we are disillusioned. We do not know what it is exactly which gives such an unattractive air to landscapes, some of which are good in composition and powerful in colour; but they have an effect of raw pigment rather than of nature, the result perhaps of the entire neglect of atmosphere. Mr. Rothenstein's "Abbey Church of St. Seine, Moonlight" (61) is a good composition and a good light effect, but the buildings suggest the idea that they are built of boards, like the practicable castles in stage scenery; there is no texture about them; while Mr. Von Glehn's landscape, "The Old Mill" (55), suggests worsted-work. Mrs. Fagan's "The Wedding Morning" (75) looks like a bad dream. In Mr. W. Orpen's figure entitled "The Eastern Gown" (84) the left arm, stretched out under the drapery, is preposterous in length. He exhibits a curious picture called "The Reflection," a figure with her back to the spectator and draped in a voluminous dressing-gown, which the mirror shows to be open in front showing the nude figure, which in the reflection is strangely colourless and posed in a manner which the lines of the actual figure do not account for. His nude study called simply "A Woman" (97) is a painting of a model of low and commonplace type, absolutely without charm of any kind; and charm is the only excuse for exhibiting a study of this kind. Mr. Sydney Lee, whose studies of buildings we have admired on other occasions, only exhibits a small picture of an old timber bridge, good in its way but not of much consequence. Mr. Wilson-Steer's "The Bend of the River" (119) is what one can only call a scrawl of paint; his half-length, "The School Girl" (123) would be pretty if he would only have allowed her a little complexion. Mr. C. J. Holmes's "Ennerdale" is a fine little landscape with some poetry in it; and Mrs. McEvoy's "A Lady Playing" (52) has the making of a characteristic picture, but can only be considered in the light of a suggestion. As for many of the other things, we seem to go from ugliness to ugliness, culminating in Mr. Blanche's odious painting called "Mother and Child" (137) which makes us glad to escape from the room.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Mr. H. T. Hare (Vice-President) in the chair.

The Crœsus (VIth Century B.C.) *Temple of Artemis at Ephesus.*

Mr. A. E. Henderson read a paper, illustrated by a large number of lantern views, on this subject, of which the following is an abstract:—

The purpose of the lecturer was to describe the actual remains found and the fragments which remained of the Crœsus (VIth century B.C.) Temple of Artemis at Ephesus, uncovered and surveyed during the British excavations directed by Mr. D. G. Hogarth in the autumn of 1904 and the spring of 1905; also to place before the Institute his suggested restorations.

He began by stating that the Crœsus Temple was the fourth structure on the site, and that there were remains of yet another (a fifth), called "the Hellenistic Temple," over and beyond it, besides large concrete masses, which were late Roman or early Byzantine, sinking low down into the foundations and rising to about two mètres above the Crœsus pavement.

He showed a large plan and sections of the earlier temples, but did not explain them, except to say that they increased in size as one superseded the other. Yet the Crœsus cella walls easily enclose the last of the three.

The general plan shown gave all the remains which were uncovered, which practically amounted to all that was left of the Crœsus and Hellenistic Temples. Before commencing his survey, the lecturer was instructed by the late Dr. Murray to measure accurately every portion of Crœsus pavement, and this he believes he has faithfully fulfilled.

He showed how the Hellenistic foundations extended beyond the earlier temple, and showed the position of a brick drain

beyond the outermost step, which had been covered by the marble paving of the court; also where the step itself survived, and the large pier foundations to support the podium steps.

He further showed photographs of the temple as excavated, and described the difficulties with water, which were successfully overcome.

The Crœsus Temple was then taken in detail. The central basis of the three earlier structures (from and near which the treasure was extracted, now on view, on the presentation of a visiting card, in the Coin Department of the British Museum) was raised and reused as the centre.

The lecturer pointed out that the foundations were practically double the length to the width, that the walls had separate foundations, but not the columns, and he showed a conduit which passed beneath the west doorway.

Foundations to the steps to the perron, or western platform, were shown both in section and by a photograph.

The paving was then described: how it was laid to no pattern, but how beautifully accurate all the joints were made.

The remains of the walling to the cella were then described; how markings were found indicating the position of the north wall, and the impression of the east wall in a mass of concrete, and how by the portions remaining the south wall could be traced from the east cross wall to the south-west anta. This walling was shown to vary somewhat to the walling left of the west wall, which shows the position of the north reveal of the great west portal.

Other portions of the superstructure were a plinth and lower base surrounded by Hellenistic foundations lying to the north-east; a plinth—greatly mutilated—to a column directly south of the south-west anta, and half a plinth lying directly to the south-west of this; and, lastly, a large mass of Hellenistic foundations, which was not explored, but it showed that settlements had occurred to the Crœsus Temple before these foundations were laid.

He then went on to describe the fragments of architecture which came to light. He began by stating that the outer rank of columns to the peristyle had larger plinths than the inner rank, and that all had a circular lower base about two mètres in diameter, formed of three orders of double astragals separated by two filleted scotias.

Many varieties of upper or torus bases were found—these he illustrated; the most usual type was parabolic in section, with horizontal flutings separated by V-grooves. Another variety was specially pointed out; the upper outline was divided up horizontally by quirked beads, the space between these in the upper half had flutings, but the lower half had reedings, the upper part being concave and the lower convex, which, as shown in the photograph, looked extremely substantial.

No complete drums of columns were uncovered, but twenty various fragments were examined and measured; it was found that fourteen of these gave forty-four, three gave forty, and three gave forty-eight flutings to the circumference. He placed the forty-four in the outer rank, the forty in the inner, and the forty-eight he did not place, as they were of an entirely new type. The flutings were alternately wide and narrow; one torus base was found to be of similar design.

Enough portions of capitals were found for the lecturer to combine these to make an entirely new drawing. He also stated that the batter outwards of the volutes was for the optical purpose of counteracting the excessive foreshortening as seen from the ground, and he mentioned that in Hellenistic times the spiral was contracted horizontally and lengthened perpendicularly for the same optical purpose.

The spiral to the Crœsus Temple was found to be a simple unwinding curve, which can be easily set out.

A suggested restoration of a rosette capital was shown, which proved to be somewhat different from the one erected in the British Museum; a leaf and dark echinus took the place of the usual egg and dart, and pointed leaves instead of elliptical were given to the rosette, besides other minor alterations.

Nothing which looked like an architrave could be found, but the bed-mould and corona were both important additions, besides several fragments of the large sculptured cymatium gutter.

The lecturer than dealt with his restored plan. He showed the data from which he planned the columns placed round the peristyle and in the pronaos. He then described his restoration within the cella enclosure, how he placed the columns along the facing found in the foundation, and he placed one column (the 127th) in the centre behind the basis, thus making the naos twice the width of its aisles.

He suggested that the thirty-six sculptured columns could be accounted for by placing them in the front rank of the ends and one at each end of the flanks, the remainder lining the central walks of the Pronaos and Porticum.

He found that the whole length of the temple platform was 109 mètres 20 centimètres, and the width 55 mètres 10 centimètres. He found that measuring from the central axis to the north and south faces of the columns in front of the antæ was the same distance practically (about 12 mètres 30 centimètres) as from these faces to the north and south faces of the outermost columns, thus dividing the façades into four equal divisions. He then showed an elevation with the height from the pavement to the underside of the architrave of this same dimension, viz., one-fourth the length of the façade. This height makes the order work out at about eight diameters. He made the entablature a quarter of this; the pediment rose another three-eighths, and with the surmounting acroteria made the proportion of superstructure to the colonnades come to as 3 is to 4.

He suggested that the roof was of tiling and timber, which would then account for the total destruction of this temple by the arson of Herostratus.

Mr. D. G. Hogarth, in proposing a vote of thanks to Mr. Henderson, said that perhaps he was the last person to have been asked to do this, because he was only less responsible than Mr. Henderson himself for certain parts of the paper. In another sense he was the right person to be called upon, as no one had seen more the assiduity and earnestness with which the reader of the paper had devoted to the work during the two seasons he was at Ephesus and for something like a year since his return. He would not venture to say much about the architectural detail which had been described, for Mr. Henderson was solely responsible for the technical detail, and the very ingenious restoration shown was entirely his own work. He might, however, say a few words chiefly from the historical point of view. Firstly, it was only right that he should lay a tribute to a very distinguished late Fellow of the Institute who was the first discoverer of the temple which had been described—he meant the late Mr. J. Wood. Of the energy and acumen which Mr. Wood showed in discovering the temple no one could speak too highly, for it was a discovery which stood in the very front rank of English archæological discoveries. Everyone had reason to be grateful to Mr. Wood for having discovered the position of the temple in a place which no one had suspected, under a covering of 18 ft. of earth. It took more than a year to trace the clue which eventually brought to light the temple. Mr. Wood did an immense service by removing the accumulation of one and a half million cubic ft. of earth from the top of the temple. Thus he did an immense service to those who came afterwards and profited by his labours. Mr. Wood was the Columbus who discovered the site, and they who followed found that a great deal of the work of clearing it had been done. Mr. Wood discovered some Hellenistic sculpture, and laid bare the temple of which Mr. Henderson had spoken. They found also that he measured with extreme accuracy the remains which he laid bare, and most carefully searched the earth which he removed. In fact, when they undertook a re-search of the removed earth, as they were bound to do, they were rewarded with practically nothing at all. As a piece of excavation in itself, considering the age in which it was done, it could hardly have been accomplished better. Of course, criticism began where it always commenced, and this was in connexion with Mr. Wood's publication, and in criticising that he was doing no more than had been done in that room by a very distinguished architect and historian. It always seemed to him that Mr. Wood never did his own admirable work justice in his publication, and that was particularly true of the early temple which Mr. Wood called the archaic temple, or, rather, his earliest temple, and which Mr. Henderson had described that night. Mr. Wood laid bare the pavement and practically all the visible remains which they had found, except at the extreme west, where he was stopped, no doubt, by the inflow of water. For some reason, which he (the speaker) had never yet understood, although Mr. Wood mentioned this temple frequently in the course of his book on "Discoveries at Ephesus," yet he never gave any plan or measurement of it, or any drawings of its details as he saw them. He did to a certain extent some time afterwards take a part in a discussion which the late Dr. A. S. Murray raised as to the restoration of certain architectural details of that temple, but, so far as the book was concerned, he ignored this very interesting early temple which he discovered under the Hellenistic Temple. It was possible that Mr. Wood might have had notes, and that had fate been kinder to him he might have published these. At any rate, the fact remained that he did not, and no notes were known to exist. The result was that, going out in 1904, their first task was to produce a plan of these remains, which were laid open between the years 1870 and 1874, but which had again been covered up with a thick growth of roots and bushes. In fact, it was a wild virgin forest, with trees growing up nearly 20 ft. high, which they had to destroy by fire. That was the great sin of omission which Mr. Wood made with regard to this temple. The other omission was that he considered this stratum of the VIth century B.C. to be the earliest, whereas there were the remains of three temples under it. As to that omission, it was practically inevitable at the time when Mr. Wood was working and the way in which he worked. He could not have provided himself with pumping machinery of anything like the strength they were able to get. With the aid of pumping every day and throwing out a small river they were able to keep the site sufficiently dry to get down to the bottom of it, but, of course, a great deal of their work had been merely groping in slime. Another reason why Mr. Wood would not have discovered these earlier temples was, as was always the case at that time, that he trusted to the method of pitting. He made round or square pits at certain intervals to see what was below. He had been digging for twenty years, and the more utterly did he reject this method of making pits. They could make them of any size they liked, but where there was a broken and disturbed stratum they could not tell what there was below. He remembered the case of Knossus. When Dr. Evans and he went out in 1900 they discussed what should be done with a certain place, and they decided to make 100 pits, and, having done so, they came to the conclusion that there was practically nothing at all to be found. They got certain fragments of stone and pottery, but they did not recognise the site as anything more than a rubbish heap which came from the Palace. Two years afterwards Dr. Evans found under that hill the Hall of the Double Axis and the Hall of Queens. He was not criticising either Dr. Evans or himself on the question of sinking the pits in the first place, because they were equally responsible for that. Well, Mr. Wood proceeded by that method when he examined the interior of the cella of the Crœsus Temple. Everything in the cella were the remains of the earlier temples. From the architectural fragments and the great treasure of nearly 3,000 objects of gold, silver, and bronze and other things which they found scattered over the area of this primitive temple he had come to the conclusion that the earliest temple was founded about 700 B.C. or a little earlier, and that most of the broken objects found there belonged to this temple, which might have lasted fifty years. After this the Samarian went away, and for his treachery was ordered to build a temple, and this was built about the year 650 B.C. Its architecture was very poor, and its foundations were of a very meagre character. He should imagine that this was only a hasty restoration, and that it did not last long, and probably it was succeeded before the year

All of them touch in one or another form on that gospel of art which Morris was the first to preach to an unwilling generation, viz.: that art consists in the first instance in a desire and endeavour to beautify the things of ordinary use. "Is Art," as the author asks in the chapter on "The Teaching of Art"—"a mere imitative impulse, a record of the superficial facts and phases of nature in a particular medium? Or is it the most subtle and expressive of languages, taking all manner of rich and varied forms in all sorts of materials, under the paramount influence of the selective search for beauty?" The latter is obviously intended to be the sound conclusion, though the author does not wish to ignore the former altogether. But in developing his idea as to the Teaching of art (as far as he admits that it can be taught), the position taken is that the study of the art of *design* should come first. "Before we can have art we must have sensibility to beauty; and before we can have either we must have conditions which favour their existence and growth. We must have an atmosphere." And this is why the study of abstract design in form, and based on architecture, is recommended, as the means of evolving and stimulating the sense of beauty in design, independent of mere imitation. Mr. Crane wishes his student to understand that it is one thing to make an accurate presentment of a figure or other object, and quite another to make them into organic pieces of decoration to fit a given space: with which we entirely agree. When he goes on to argue, however, that a purely pictorial training which may end in failure to produce sufficiently successful pictures, does nothing to fit the student for other fields of art, and leaves him before the simplest problem of designing helpless and ignorant, then we should say that his pictorial training has been bad. Painters who have made a real success in pictorial work have always paid a great deal of attention to lines of composition; as an eminent landscape-painter remarked to us one day, "We are as careful of our lines of pattern in a landscape as you architects are in a decorative design"; which may be a little exaggeration, but certainly pictorial work, whether of figures or landscape, does include the notion of design, if not exactly in a decorative sense (as the word "decorative" is usually understood), at all events in the sense of balance of line and of light and dark masses. To say, as Mr. Crane does on another page, that the cabinet or "competitive" gallery picture has destroyed painting as an art of design, is a statement we cannot accept. Pictorial work, in its best form, is design with something else superadded; what that is we will consider just now. Mr. Crane wants everything to be studied in relation to something else; he criticises the Life School Study of the Academy as only "the study of the human frame as isolated from everything else." But the human frame itself is enough matter for study in the first place. The student has to know that thoroughly first; when he does, he can be at liberty to consider its treatment in composition—either in the free composition of pictorial work, or in the more bounded and conventional composition of purely decorative work. But accurate and complete knowledge of the figure comes first. Study of design will not bring that.

Among the subjects on which Mr. Crane touches in regard to the art of common things we may mention two. One is, in regard to the ugliness and monotony of small houses for the poorer class—"small brick boxes with slate lids, packed together in straight rows." He suggests that the collective dwelling, "of which we perhaps see the germ in the better type of modern flats," may have an important future; and he gives a plan and elevations by his son, Mr. Lionel F. Crane, who is an architect, showing a collection of cottage homes around an arcaded cloister, with a green and a fountain in the centre, and a common dining-hall and reading-room occupying one side of the quadrangle. A kitchen and baths wing projects out from one angle of the parallelogram. The idea is well worth consideration. Whether the poorer class would really like a common dining-hall in preference to the family meal in the small room may be doubtful; there is no doubt, however, that it would be better for them hygienically. The other point is in regard to dress. His sketches of simple but picturesque dress for women and children are very pretty; though Mr. Crane admits that ladies' dress is at present, for the most part, artistic; but he objects (with reason) that it is so subject to the mere influence of fashion, and does not arise out of the deliberate choice of the beautiful. The dress of the modern gentleman he considers hopeless. We have to go for the picturesque to the peasants' and artisans' dress (he gives sketches of a fisherman and a navvy); a dress for utility generally comes out more or less picturesque; even the modern gentleman's dress becomes picturesque when he dresses for athletics—for use and not for show. "If we lived simple useful and beautiful lives, we could not help being picturesque in the highest sense." Mr. Crane gives an amusing sketch (reminding one of Pugin's "Contrasts" in architecture) of a gentleman in the present-day evening-dress contrasted with one of the XIVth century. He has rather made the worst (one is tempted to do so in such cases) of the modern gentleman, making him look like a fool, which is not a necessary part of the programme. But it must be remembered that the ideal of the gentleman in modern society includes a feeling in favour of a certain reserve and quietude of manner, which is at variance with and would not be expressed by any special picturesqueness of costume. There may be too much of this reserve; but that is our way of life now, and the dress expresses it, as the XIVth century gentleman's dress expressed his life, which was by no means so respectable as ours. And then there is a great deal in association; what we see every day becomes commonplace to us. It may not appear so commonplace to writers on art three hundred years hence. The tall hat has lasted so persistently that it seems to answer to some demand in modern life; probably the secret is that there is a certain dignity of demeanour inseparable from it. However, we are not defending it, only suggesting the possible reason for its hold on our tastes. We do not think modern evening dress as bad as Mr. Crane does. It is reserved and dignified. What it wants is a little colour—embroidered waistcoats, for instance, which might very well be combined with it, and the substitution of knee-breeches and stockings for the shapeless trouser-leg. But even as it is we do not think it deserves all that is said against it.

Among Mr. Crane's ideals as to the conditions of art is evidently Socialism, though the word is not used. "Is it wonderful that monopoly in art should follow monopoly of land and the means of subsistence?" We doubt if such theories lead anywhere. History shows no rule on the subject. A free people like the Greeks had a great art; an aristocratic and tyrannous epoch like that of Renaissance, a period too of almost abnormal wickedness and licence, had great art also. There is no systematic and necessary connexion between art and ethics. It is probable that early Republican Rome was a very inartistic community; the best of Roman art was developed under the Empire. Therefore the pages in Mr. Crane's book devoted to "the social and ethical bearings of art" we do not find very convincing. The ideals here are too ideal. The theory of life and art set forth seems a beautiful and complete one, but it has often been falsified in history, and there is no proof that it can be realised now. What is true in the author's view is the ideal of a condition of life in which there should be a general desire and aim to make common and every-day things beautiful. On this he has much to say that is true and valuable. There was a time in England, during the mediæval period, and even during the early Renaissance or transition which we call the Jacobean period, when this was so, when there seem to have been no ugly things made. What has killed it? There is something in the idea that it is the surviving influence of the Puritan rule, but that cannot explain it altogether. Even in the Queen Anne period, when unquestionably there were ugly churches, there was beautiful silver work and interior house decoration; not rich with the richness and luxuriant beauty of the Italian Renaissance, but almost perfect in good taste. Where had the good taste vanished to in the earlier part of the XIXth century? In the Queen Anne period there was silver that was ornamental without meaning to be so; in the Victorian period there was silver that meant to be ornamental and was hideous. The explanation of it lies deeper than in forms of government or the condition of the poor. It is doubtful whether it can be explained at all on any general theory of the relation of life and art. But we can see that it is true, as Mr. Crane points out, that there is an entire change of spirit from the time when all the arts of design were centred in architecture, to the time when, as now, art has become so much more a personal and individual work.

That is the author's complaint, but surely there is a great interest in this individualism. And in the most intellectual forms of art it is inevitable. It is the same with music. With the music of the people in an early period of the art, there was a Folk-music which had its

national character, and seemed to be a spontaneous growth. But when the great composers came, each had his own personal style, as each of the great painters in the later Renaissance had his own personal style, and can be recognised by it. And it is here that we part company fom Mr. Crane. We quite agree with all he says as to the need of a general feeling for the beautiful in the everyday things of life, but we must recognise that there is a higher form of art which rises above the everyday things; and it is here that personal genius and temperament come in. The industrial and applied arts are all relative; they are connected with the use of an article, and are influenced, or should be, by the material of which they are made. Mr. Crane wants all art to be "relative." He thinks the gallery picture, unrelated to anything but itself, "has destroyed painting as an art of design." As already remarked, the best painters, even of landscapes, pay much attention to composition of line. But the fact is that painting in its highest and most intellectual development is something *more* than an "art of design." We quite agree with the author in the remark, in the chapter on "The relation of the easel picture to decorative art," that "mural feeling" in a picture includes "a certain flatness of treatment with choice of simple planes and pure and low-toned colours, together with a certain ornamental dignity or architectural feeling in the structure of forms and lines of composition"; all this is perfectly true, and we agree with it entirely; but then he has to conclude—"and is generally antithetic to accidental or superficial characteristics or what might be called landscape effects." Exactly: but what does that come to? To this: that every picture treated relatively to something else, must give up something of its own intensity and completeness. But then what is to become of Titian, and Velasquez, and Turner, perhaps the three greatest names in easel-painting? You can never reduce them to relativity; they are far too intensely alive. Are we to give them up? And the argument applies to many other painters; to all who have original genius enough to put their own life and originality into their own creations, whether of figure pictures or of landscape.

No: all this depreciation of the easel picture, because it is "relative" to nothing, is a mistake. We do not say that there is any gulf fixed between applied art and personal art; the one leads by steps up to the other; but no theorising will ever persuade us that decorative design is a matter of equal intellectual interest with a pictorial creation of the highest class, or that the latter has not a right to be studied and admired for itself alone, apart from any question of its relation to its surrounding. Painting in its highest form is an intellectual art in a sense in which decoration is not, and takes its stand on pretty much the same level as poetry. A great picture is a poem addressed to the intellect through form and colour, and is to be judged on its own merits and not in relation to its surroundings. And what goes to make a great picture? There we come on the subject of Mr. Clausen's book, to which we will return in another article.

THE PRESERVATION OF CASTLES IN GERMANY.

WE have received from Herr Bodo Ebhardt, whom some of our readers will remember as one of the most eminent of our foreign visitors at the recent Architectural Congress, a copy of an interesting paper on the mediæval civil architecture of Germany, especially in regard to the preservation and to some extent restoration of her ancient castles. On this latter subject Herr Ebhardt possesses a great deal of special knowledge, and has been commissioned by the German Emperor to undertake the study and the preservation of some of the most important of the mediæval castles of Germany.

Herr Ebhardt, in the paper referred to, points out how impossible it is to overrate the important position which is held by castles in the study of the architecture of that period. The remains of mediæval castles are the oldest witnesses of civil buildings which early centuries can produce; they date mostly from a period which otherwise can offer us none other than ecclesiastical remains; and in Germany, at any rate, the ruins of these splendid structures testify to a development of stone construction which reached a far higher standard of perfection than is usually admitted.

The care of ancient castles has for long been recognised in Germany as a necessity. Only the impetus was wanting to give practical expression to the universal wish of preserving the thousands of splendid remains, interesting both historically and artistically, that are scattered over the land. Six years ago a handful of eager spirits founded what they styled "The Society for the Preservation of German Castles"; and so active has it been that it has thoroughly awakened the public conscience, and to-day in German circles the preservation of ruinous castles is considered an unquestionable duty. Even municipal authority is ready to aid and abet the movement, as is illustrated by the action recently taken with regard to Wartburg Castle, the crown of all Thuringia, and the most prominent feature in the landscape of Eisenach. In order that it may ever retain its dominating character, a blue line has been drawn on the map of the locality, which line limits the height of the buildings erected in its neighbourhood. Unfortunately, however, legislation on the matter is still far from complete, and municipal interference may hasten on destruction instead of averting it, as in the case of the Bavarian castle of Elmstein. Elmstein was one of the oldest possessions of the Counts of the Palatinate: the earliest reference to it is in records dating from 1212. The District Council recently ordered the present owner to repair certain cracks of long standing, in the ramparts, but this gentleman, rather than incur the expense entailed, ignored the order. Two weeks later he was fined by the Sheriff's Court the sum of 1 mark (1 shilling) for disregarding the order, and "for not removing the ruin." The ruin has since been "removed" for the value of its building material.

The original band of thirty members of the Society has swelled to 700, drawn from all classes and professions, from Duke Ernst Günther of Schleswig-Holstein to hotel-keepers. Not only do the members display remarkable activity in attending the meetings, following the works and assisting in the execution of arrangements planned by the Society, but the Emperor has shown his approval of the work by attending some of the public meetings where papers of special interest were read. He has further acknowledged the Society by presenting to it the Crown property of Marksburg. This is one of the oldest but best-preserved castles on the Rhine, which was long used as a prison, and consequently was much defaced and patched up. The Society has been engaged in restoring the whole building to its original form, turning part of it into a museum and library, to which members present pictures, arms, furniture, books, etc. The enterprise is proving a financial success, in that the number of visitors has risen from 300 in previous years to 12,000 in the past year.

The Society was founded in March, 1899, with the object, first, of preserving German castles as monuments of national history and art; second, of inquiring into the historical and artistic origin of German castles, and by means of its journal, *Der Burgwart* (Care of Castles), publishing such knowledge for the public benefit. In order to compass its end, the Society undertakes to give advice and assistance to existing societies which have the care of isolated districts or particular buildings, to found new local societies when it is deemed advisable to keep a watchful eye on any ruin, to hold meetings and read papers for the benefit of the public, to support a private journal, to review literary works bearing on the subject in hand, as well as to report on the activity of the Press in such matters; to form a collection of sculpture, books, objects of art, etc.; to report on the changes occuring in the ownership or buildings of German castles; to assist with advice and money individual owners who require help in order to preserve their castles from ruin, and to acquire by purchase or gift such castles whose condition demands this, and which would prove serviceable to the Society.

Such is the programme laid out for itself by this energetic body, and that it is not mere talk is proved by the records kept by *Der Burgwart*. Each number of this monthly journal contains two short articles, illustrated by numerous plans and views, on any two castles which show particular points of interest. In the limited space allotted for each article the building cannot be dealt with exhaustively, but just so much is outlined of its origin and history, its legends hinted at, its past and present state commented on, as to arouse the interest of the reader, and to awaken his desire to see the place and pursue investigations, or to give pecuniary assistance in the work of restoration. Castles in every state of preservation are considered of equal interest, whether they be still inhabited, like Tenneberg Castle, Thuringia, which is of such remote antiquity that its founder cannot be traced, or whether their ruins lie, like the Silesian castle of Zobten, a foot below the soil.

Under the heading "Structures in Danger" are catalogued castles which have attracted the notice of members,

and which may yet be saved from total ruin or deliberate destruction, such as the fine keep of Neu-Blankenheim, which the owner proposed selling to a contractor whose intention it was to level the ruins and build a saw-mill on the site. That these warnings bear fruit is illustrated by the fate of Auerbach Castle. The owner proposed pulling down the 10 ft. high remains of an XIth century circular tower, in excellent preservation, in order to erect a villa on the spot. As such another tower is not to be found in Saxony, the *Burgwart*, ever watchful, published this proposal, with the result that the necessary steps were taken to prevent the owner from committing this act of vandalism. But such measures cannot always be taken in time, and tales are not wanting of reckless demolition such as was perpetrated at Altona Castle, Schüttorf. The castle had been recently bought by a banker, who, for motives of safety, took down the greater part of "the tottering walls." The only way in which these tottering walls could be induced to fall was by blasting them steadily for five days with dynamite.

Under the heading "Reconstructions" one finds much instructive and interesting reading. Those castles are catalogued that are undergoing repair, and advice is offered in a friendly way, when the plans or methods adopted are open to criticism. For instance, the proposed alterations to Castle Elsterberg, partly undertaken by the State, are strongly objected to, and the free use of iron ties and cement coping condemned as harmful in the end to the building, and unworthy makeshifts for a State to resort to. This poor work is the result of the practice, unfortunately very common in Germany, of saving architects' fees by leaving the work of restoration to builders. It is pointed out, as a general principle, that the first care should be to retain the original *form* of a monument, and that the next most important point is the *material*. Repairs are generally delayed so long that the original outer skin has too often to be removed and replaced by new material.

Not only advice but pecuniary aid is given when a case is urgent. In 1902, when the Association was only in its fourth year, and consequently not overburdened with funds, it gave 8,000 marks towards various restorations. As it is not in a position to assist all deserving cases, the Society appeals eloquently to the State to come forward and help impecunious owners who cannot, and should not be expected, to bear alone the expense of preserving for posterity their costly national inheritances.

EXTENSION OF TRAINING COLLEGE, PRESTWICH, SALFORD.—Salford College, which is situate on a site in Sedgley Park, and is used for the training of female teachers for the Catholic elementary schools, has been enlarged by the erection of an annexe. In the basement of the new structure are the students' common-room, an assembly-room, about 80 ft. by 40 ft., to seat about 250 persons, a lecture-room, with the seats arranged in tiers, and a physical and chemical laboratory. The ground floor is occupied by three classrooms, an art-room, the principal's apartment, dining-room, and pantry. A corridor, with tiled floor and dado, runs down the middle, 120 ft. long and 13 ft. wide. Upstairs are the three dormitories, divided into separate cubicles. The contractors were Messrs. Neill & Sons, and the architect was Mr. Oswald Hill, of Manchester. The cost of the extension has been 10,000*l*.

NOTES.

The Thames Ocean Wharf Project.

SINCE the publication of our "Note" on March 11 last year the scheme for the construction of extensive wharves, transit sheds, and incidental works near Greenhithe has begun to assume practical shape. Therefore the time is appropriate for a word of protest against the announced intention to build the wharves entirely of timber. Disastrous fires on the Thames, in New York Harbour, in Antwerp Docks, and elsewhere have sufficiently proved the undesirability of timber for the construction of wharves, quays, and sheds; and practical experience shows how liable it is in all tidal waters to injury by sea worms and decay. In view of the satisfactory results given by concrete-steel wharves and jetties on the Thames and in various harbours of the United Kingdom, we are somewhat surprised that an engineer of such repute as Sir John Wolfe Barry should allow his name to be associated with the proposal to construct these important works of a material whose inferiority is now generally admitted.

Trade Effluents and Public Sewers.

THE *Times* on the 19th inst. stated that the Local Government Board in connexion with the amendment of the Public Health Acts was considering the advisability of establishing a Central Board capable of acting as referees or arbitrators in matters in dispute between manufacturers and the local authorities arising out of the discharge of trade effluents into public sewers. The *Times* points out that the Police and Sanitary Committee recently presented a report to the House of Commons recommending that steps should be taken to carry out the recommendations of the Royal Commission on Sewage Disposal in the third interim report, which was presented so long ago as March, 1903, which recommended the establishment of a central authority. It appears, however, that there is some difference of opinion in various parts of the country as to whether the manufacturers should be allowed the use of the sewers subject to previous treatment of the effluent by the manufacturers, relief being given in exceptional cases from treatment of the effluent on payment of a special contribution (the course recommended by the Royal Commission), or whether the special charge should be the rule, and the manufacturers should be relieved from treating the effluent. Whichever of these two views be adopted there appears to be little doubt that uniformity in practice is most desirable, and that the difficult questions likely to arise in connexion with this subject should be determined as expeditiously and economically as possible.

Builders and Workmen's Compensation.

A CURIOUS contention was raised in the case of Greenwood *v.* Hawkings, an action for indemnity for compensation paid under the Workmen's Compensation Act, 1897. The plaintiffs in the action were the undertakers of the building work at the Guildhall Tavern, King-street, the defendants were sub-contractors, who had undertaken the carving work on the stone of the building. One of the defendant's men was killed in the operations, and the plaintiffs had, under sect. 4 of the Workmen's Compensation Act, been proceeded against by the man's dependants for compensation, and now claimed the amount paid as compensation, and the costs of the arbitration from the defendants. The defendants had been selected by the architect to do the work, and they contended that their contract was not with the plaintiff but with the architect. A letter had been sent by the plaintiff to the defendant which contained the following passage: "Execute the whole of the carving. . . . You agree in accepting this order to sign and send by return of post the enclosed accident indemnity." This indemnity was an undertaking to indemnify the plaintiff from claims made by the defendant's workmen under the Workmen's Compensation Act. The defendants did not sign and return the form of indemnity, but they proceeded to carry out the work. The judge held that by thus proceeding with the work they had tacitly assented to the terms of the contract and had entered into contractual relations with the plaintiffs. A second contention was that the accident had been caused by the negligence of the plaintiffs themselves in the lighting and fencing, but this was also negatived, and the plaintiff recovered the compensation paid and costs incurred. The indemnity offered to the defendant to sign seems to have been directed to avoiding the difficulties experienced in construing sect. 4 of the Act. By that section the undertakers are entitled to be indemnified by their sub-ordinates; but its language has caused some difficulties. In this case it would appear there would have been no difficulty in claiming indemnity under the section, apart from the contract, but the point on which the latter became material was whether such a contract existed between the parties as to make the section apply.

Fire Risks in Parish Churches.

IN a letter to the *Times*, Mr. Eustace Balfour directs further attention to the necessity of providing fire-extinguishing apparatus in parish churches. His experience is that the average village church is totally unprovided with means for preventing damage by fire—a state of things suggesting neglect of an obvious duty rather than praiseworthy trust in Providence. The cost of the necessary appliances is not heavy, and we feel sure would be defrayed by the inhabitants of parishes containing historic churches, or even modern ecclesiastical buildings. As Mr. Balfour points out, the problem of water supply may be variable, but can always be solved in satisfactory manner. Mr. Balfour's description of organ construction must not be read too literally. An organ is by no means "entirely of wood, in thin pieces"; metal pipes are far more numerous than those of wood; metal is employed for various mechanical movements, and much of the wood is in fairly thick pieces. Still, as stated in our "Note" of November 17th, the construction is highly inflammable, and naked lights ought to be strictly prohibited. A useful suggestion by Mr. Thackeray Turner, is that electric torches should be substituted for the customary

candle, and we may add that compact forms of portable electric hand lamps with accumulators—such as are used in mines, factories, and ships—can now be obtained, giving a 6 c.-p. light for upwards of fourteen hours. These provide a perfectly safe alternative to the candle for all places where electricity is not otherwise available.

Motor Omnibuses and Noise.

AT the dinner of the Motor Union, held last week to celebrate the tenth anniversary of the Act legalising motor-cars, Sir Edward Henry, in responding on behalf of the police, made an interesting statement in connexion with motor omnibuses. He stated that draft regulations had been drawn up and had received the approval of the omnibus owners, with the exception of that provision which provided that the machinery must not make "undue noise." What amounted to "undue noise," Sir Edward observed, had given rise to some contention, because there was no fixed standard by which noise could be estimated, and it depended on the hearing, nerves, and opinion of the individual; but he intimated that an eminent scientist in connexion with Lord Rayleigh was considering the possibility of inventing a machine to standardise noise. Noise, however, as has been proved in connexion with sound signals from lighthouses, varies considerably with both atmospheric conditions and the immediate surroundings of the object which emits the noise. London streets are peculiarly resonant, and noise is often more apparent from the upper stories of the houses than on the ground floors. Machinery also is capable of being worked noisily, and mechanicians, if once their omnibuses had passed the standard, might become careless in the subsequent working.

Liabilities of Motor-Car Owners.

THE case of Du Cros *v.* Lambourne, recently decided by a Divisional Court, is one of considerable importance on motor-car law. The appellant was the owner of a powerful motor-car, and was also a duly licensed driver. He was summoned for driving to the danger of the public at a speed of about 50 miles an hour. At the time in question a lady was occupying one of the front seats in the car, who also was a licensed driver. There was a conflict of evidence as to whether the appellant or this lady was driving the car: The justices, without determining this issue, had convicted the appellant on the ground that if he was not driving himself, as an experienced driver of motor-cars he must have known that the speed the car was travelling was dangerous to the public, and should have prevented the lady from so driving—in other words, that he was aiding and abetting the offence. The Divisional Court have upheld the conviction, and laid it down that the person aiding and abetting can be charged with the principal offence. This being the law, it would appear that in future owners who are experienced drivers will no longer be able to allow their chauffeurs to drive to the danger of the public without themselves being amenable to the law. Since the above decision was delivered the Motor Union, at the recent conference, have intimated that no objection should be raised to a change in the law making an owner liable for abetting. The decision in this case apparently had not been brought to their notice.

Damages for Causing Subsidence in Highways.

THE case of Mayor, etc., of Wednesbury, *v.* Lodge Holes Colliery Company, commented upon by us December 16 last, has been carried to the Court of Appeal, where the decision has been reversed. The question was simply what was the measure of damages against the defendant, for having caused subsidence in a road vested in the plaintiffs by virtue of sect. 149 of the Public Health Act, 1875, by reason of the defendants' mining operations. The plaintiffs claimed 400*l*., which was admitted to be a reasonable sum if the road had to be restored to its original levels, but the defendants contended that it could be made as commodious for the public as it was before for 80*l*., and they paid this sum into court, and the judge of the court below had accepted the defendants' view, and given judgment for them. This view excluded the risk of continued subsidence, and limited the powers of the plaintiffs to merely maintaining the roadway as a road. The Court of Appeal, in considered judgments, have reversed this finding, and the effect of the decision is this, that the public authority as trustees for the public were entitled to have regard to all the rights and amenities of the highway, nay, were bound to do so, and that as they had acted on competent expert advice in restoring the road to its old level, they had acted reasonably in accordance with their statutory duties, and the defendants, as wrongdoers, were liable in damages for the cost of carrying out the work.

Projections over Pavements.

THE Liverpool Improvement Act, 1882, enacts that "It shall not be lawful without the written consent of the Corporation to construct, place, fix, or hang any . . . sign . . . so as to project over the surface of any street at any time, or so as to allow any suspended load to hang over the surface of the street at any time." In the recent case of Goldstraw *v.* Jones, an iron pole to support a flag or advertisement was placed through an open window, bolted to the building by a screw bolt and nut, 20 ft. above the street level, and projecting 6 ft. beyond the building-line. This pole had to be removed whenever it was required to shut the window. The magistrate considered that this projection was not of such a fixed and permanent character as to come within the terms of the section, but the Divisional Court have held this to be a "sign."

A New Point for Boiler Owners.

AS THE result of the Board of Trade inquiry into the boiler explosion at Cradley Heath in July last the Commissioners stated a principle that may come as a surprise to many owners of steam boilers. The boilers to which we here refer had been duly insured and regularly examined by the inspectors of the insurance company. The Commissioners found, however, that the examinations were "loose and unsatisfactory," and characterised as "a pure invention" the certificate, signed by the chief assistant engineer to the company, to the effect that the boiler was in order, and that it had been properly prepared for examination. Moreover, they decided against the view that the boiler owners "could escape liability by having an annual inspection of their boilers only by an inspector of an insurance company." This point ought to be noted by architects who instal steam generating plant, and are not infrequently expected to give their clients some hints on the questions of insurance and inspection.

Electric Machinery.

PROFESSOR J. EPSTEIN, of Frankfort, read an interesting paper on the "Selection and Testing of Materials for the Construction of Electric Machinery" to the Institution of Electrical Engineers this week. So many qualities—electrical, thermal, and mechanical—of materials have to be considered when judging their relative values for electrical work, that it is exceedingly difficult to lay down any general rules as a guide for the manufacturer. We think that Professor Epstein's advice to engineers not to lay too much stress on those qualities of bodies which can be easily measured to the neglect of other qualities which are of equal or even greater importance in practical work, was both timely and valuable. His account of the standard German methods will be useful, and may possibly lead to some changes in the everyday practice in this country. The diagrams illustrating the progressive deterioration or the "ageing" of some of the qualities of the iron sheets used for field magnets and transformers are valuable, as they show the magnitude of this effect, but no hint is given of the treatment by which several English manufacturers prevent this "ageing." The method described of testing the micanite tubes used for insulating the armature conductors used in high-pressure machines was not very convincing. It is not obvious that the heating effect is due to "dielectric hysteresis." Many simpler explanations might be given. In the paper, laboratory tests are occasionally disparaged when compared with workshop tests. It is stated also that the values deduced by empirical formulæ from the experimental data obtained by tests on similar machines previously constructed are often notably different from those deduced from "theoretical considerations." We think that both these statements are apt to produce erroneous impressions as to the value of laboratory tests and theory. The results obtained by careful laboratory tests are rigorous. Errors arise when engineers apply these results to cases where the forces acting are measured wrongly, or when they leave some of them out of account altogether. In these cases "theory" and "laboratory" tests are blamed. One or both of these may be faulty, but a much simpler explanation often suffices.

The Cement Industry.

IN a lengthy paper on "Recent Progress in the Cement Industry," recently communicated to the Society of Chemical Industry, Mr. Bertram Blount discusses

many of the problems which are at the present time occupying the attention of cement makers. Mr. Blount thinks that in the future Portland cement will be made by fusing the unground raw materials in a furnace, from which it will be tapped while liquid. The fused material will be granulated by air or steam so that it may be readily ground. Many cement makers will refuse to follow Mr. Blount in his forecast, which would include the obsolescence of rotary kilns and grinding machinery for the raw materials, but his speculations are scientifically sound and merit careful consideration. With reference to Dr. Passow's method of making slag cement, about which so much has been heard lately, Mr. Blount says that although he was at first sceptical about the quality of the cement, he now admits, after investigation of the process, that "it is practicable to prepare hydraulic cement of great strength from suitable blast furnace slag by the regulated cooling of the slag while solidifying." In the discussion much divergence of opinion was revealed on the subject of wet *versus* dry mixing of the raw materials for cement making. Mr. Spoor said that Edison's rotary kiln at Stewartsville used with a dry process consumes less than 17 per cent. of fuel, and this is the best record of the world. The kiln is 150 ft. long, and makes 1,000 tons of cement per week.

Geffery's Almshouses, Shoreditch.

THE Society for the Protection of Ancient Buildings, the National Trust, and the Metropolitan Public Gardens Association have addressed a memorial to the Charity Commissioners against the proposed sale of the site and materials of the almshouses in Kingsland-road, Shoreditch. The records of the Ironmongers' Company show that in 1703 Sir Robert Gefferys, or Geffrey, bequeathed to them, in trust, all of his estate, a few legacies to some relatives excepted, to be converted into money and to be laid out in the purchase of ground for an almshouse for so many as the rents and proceeds—each inmate to receive 6*l.* per annum and 15*s.* for a gown—would support. The Ironmongers' Company bought a parcel of ground at the corner of Pearson-street in Kingsland-road, and built on it fourteen houses and a chapel. Some years ago the real and personal estate of the charity yielded a total income of nearly 1,700*l.* per annum. The charity had meanwhile been augmented by means of a bequest in trust of 3,500*l.* Consols, under the will (July, 1846) of William Wild, whereby the Company became enabled to add about 93*l.* yearly to the pensions paid to the almspeople. The memorialists direct attention to the typical character of the almshouses, which retain the architectural charm of buildings of the period. They urge that their destruction would break a valuable link in the chain of the domestic history of London, and remove a standing example of the charity and benevolence of her citizens. The buildings were lately re-roofed, the chapel has been newly decorated; in front of the houses is a large garden containing some fine trees. The whole place, indeed, affords one of the few remaining examples of the many similar institutions which in the course of the XVIIth and XVIIIth centuries were established in this and other parts of East and North-East London, forming a homely and pleasing feature in localities which at that time constituted nearer suburbs of the town.

The Fine Art Society.

ALL our readers who have admired the fine and original drawings which the late H. W. Brewer for so many years contributed to the *Builder*, will be interested to learn that his son, Mr. H. C. Brewer, inherits some of his talent in the pictorial representation of architecture, and has now on view at the Fine Art Society a collection of sixty water-colours of subjects in Spain, chiefly architectural. Among our lithograph plates this week we have given small reproductions of five of these drawings, which are exhibited under the general title "The Cities of Spain," though among them there are also a few studies of the arid stony landscape of the country. The architectural subjects include representations of a great many of the most remarkable of the mediæval monuments of Spain, at Burgos, Toledo, Segovia, Cordova, etc., and the buildings are pourtrayed with a great feeling for colour and poetry of effect. We hope those of our readers who admired the late Mr. Brewer's drawings will go and see the work of his son. In the same gallery is a collection of "Water-colours in Devon and Cornwall" by Mr. S. J. Lamorna Birch. Though rather wanting in purity of colour, there is a great deal of effective work in these drawings, of which perhaps the best is "The Last Long Streaks of Snow" (86), which is in a broader style than most of them. Among others that we were struck with are the grey sea in "The Foot of Carn Bargis" (63); "The Gloaming" (66); and "Solitude" (115). Miss Eulabee Dix's portrait miniatures, in the same gallery, are very good examples of a form of art which does not attract us very much.

The New English Art Club.

THE early numbers in the catalogue of the New English Art Club (which again exhibits in the gallery at the back of Deringyard, Bond-street) are rather reassuring. Mr. A. W. Rich, whose landscape sketches used to be too defiantly untidy, has reformed in this respect, and his small landscape studies on toned paper, Nos. 1, 15, 23, and 32, are very interesting, No. 15 very much reminding one of De Wint. Mr. Orpen's two pencil sketches of mother and child (7 and 11) are very good, and Mr. Muirhead Bone has made an interesting small picture of "The Great Gantry, Charing Cross Station" (16), a rather unusual subject. It is when we come round the corner to the oil paintings that we are disillusioned. We do not know what it is exactly which gives such an unattractive air to landscapes, some of which are good in composition and powerful in colour; but they have an effect of raw pigment rather than of nature, the result perhaps of the entire neglect of atmosphere. Mr. Rothenstein's "Abbey Church of St. Seine, Moonlight" (61) is a good composition and a good light effect, but the buildings suggest the idea that they are built of boards, like the practicable castles in stage scenery; there is no texture about them; while Mr. Von Glehn's landscape, "The Old Mill" (55), suggests worsted-work. Mrs. Fagan's "The Wedding Morning" (75) looks like a bad dream. In Mr. W. Orpen's figure entitled "The Eastern Gown" (84) the left arm, stretched out under the drapery, is preposterous in length. He exhibits a curious picture called "The Reflection," a figure with her back to the spectator and draped in a voluminous dressing-gown, which the mirror shows to be open in front showing the nude figure, which in the reflection is strangely colourless and posed in a manner which the lines of the actual figure do not account for. His nude study called simply "A Woman" (97) is a painting of a model of low and commonplace type, absolutely without charm of any kind; and charm is the only excuse for exhibiting a study of this kind. Mr. Sydney Lee, whose studies of buildings we have admired on other occasions, only exhibits a small picture of an old timber bridge, good in its way but not of much consequence. Mr. Wilson-Steer's "The Bend of the River" (119) is what one can only call a scrawl of paint; his half-length, "The School Girl" (123) would be pretty if he would only have allowed her a little complexion. Mr. C. J. Holmes's "Ennerdale" is a fine little landscape with some poetry in it; and Mrs. McEvoy's "A Lady Playing" (52) has the making of a characteristic picture, but can only be considered in the light of a suggestion. As for many of the other things, we seem to go from ugliness to ugliness, culminating in Mr. Blanche's odious painting called "Mother and Child" (137) which makes us glad to escape from the room.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Mr. H. T. Hare (Vice-President) in the chair.

The Crœsus (VIth Century B.C.) Temple of Artemis at Ephesus.

Mr. A. E. Henderson read a paper, illustrated by a large number of lantern views, on this subject, of which the following is an abstract:—

The purpose of the lecturer was to describe the actual remains found and the fragments which remained of the Crœsus (VIth century B.C.) Temple of Artemis at Ephesus, uncovered and surveyed during the British excavations directed by Mr. D. G. Hogarth in the autumn of 1904 and the spring of 1905; also to place before the Institute his suggested restorations.

He began by stating that the Crœsus Temple was the fourth structure on the site, and that there were remains of yet another (a fifth), called "the Hellenistic Temple," over and beyond it, besides large concrete masses, which were late Roman or early Byzantine, sinking low down into the foundations and rising to about two metres above the Crœsus pavement.

He showed a large plan and sections of the earlier temples, but did not explain them, except to say that they increased in size as one superseded the other. Yet the Crœsus cella walls easily enclose the last of the three.

The general plan shown gave all the remains which were uncovered, which practically amounted to all that was left of the Crœsus and Hellenistic Temples. Before commencing his survey, the lecturer was instructed by the late Dr. Murray to measure accurately every portion of Crœsus pavement, and this he believes he has faithfully fulfilled.

He showed how the Hellenistic foundations extended beyond the earlier temple, and showed the position of a brick drain

beyond the outermost step, which had been covered by the marble paving of the court; also where the step itself survived, and the large pier foundations to support the podium steps.

He further showed photographs of the temple as excavated, and described the difficulties with water, which were successfully overcome.

The Crœsus Temple was then taken in detail. The central basis of the three earlier structures (from and near which the treasure was extracted, now on view, on the presentation of a visiting card, in the Coin Department of the British Museum) was raised and reused as the centre.

The lecturer pointed out that the foundations were practically double the length to the width, that the walls had separate foundations, but not the columns, and he showed a conduit which passed beneath the west doorway.

Foundations to the steps to the perron, or western platform, were shown both in section and by a photograph.

The paving was then described: how it was laid to no pattern, but how beautifully accurate all the joints were made.

The remains of the walling to the cella were then described; how markings were found indicating the position of the north wall, and the impression of the east wall in a mass of concrete, and how by the portions remaining the south wall could be traced from the east cross wall to the south-west anta. This walling was shown to vary somewhat to the walling left of the west wall, which shows the position of the north reveal of the great west portal.

Other portions of the superstructure were a plinth and lower base surrounded by Hellenistic foundations lying to the north-east; a plinth—greatly mutilated—to a column directly south of the south-west anta, and half a plinth lying directly to the south-west of this; and, lastly, a large mass of Hellenistic foundations, which was not explored, but it showed that settlements had occurred to the Crœsus Temple before these foundations were laid.

He then went on to describe the fragments of architecture which came to light. He began by stating that the outer rank of columns to the peristyle had larger plinths than the inner rank, and that all had a circular lower base about two mètres in diameter, formed of three orders of double astragals separated by two filleted scotias.

Many varieties of upper or torus bases were found—these he illustrated; the most usual type was parabolic in section, with horizontal flutings separated by V-grooves. Another variety was specially pointed out; the upper outline was divided up horizontally by quirked beads, the space between these in the upper half had flutings, but the lower half had reedings, the upper part being concave and the lower convex, which, as shown in the photograph, looked extremely substantial.

No complete drums of columns were uncovered, but twenty various fragments were examined and measured; it was found that fourteen of these gave forty-four, three gave forty, and three gave forty-eight flutings to the circumference. He placed the forty-four in the outer rank, the forty in the inner, and the forty-eight he did not place, as they were of an entirely new type. The flutings were alternately wide and narrow; one torus base was found to be of similar design.

Enough portions of capitals were found for the lecturer to combine these to make an entirely new drawing. He also stated that the batter outwards of the volutes was for the optical purpose of counteracting the excessive foreshortening as seen from the ground, and he mentioned that in Hellenistic times the spiral was contracted horizontally and lengthened perpendicularly for the same optical purpose.

The spiral to the Crœsus Temple was found to be a simple unwinding curve, which can be easily set out.

A suggested restoration of a rosette capital was shown, which proved to be somewhat different from the one erected in the British Museum; a leaf and dark echinus took the place of the usual egg and dart, and pointed leaves instead of elliptical were given to the rosette, besides other minor alterations.

Nothing which looked like an architrave could be found, but the bed-mould and corona were both important additions, besides several fragments of the large sculptured cymatium gutter.

The lecturer than dealt with his restored plan. He showed the data from which he planned the columns placed round the peristyle and in the pronaos. He then described his restoration within the cella enclosure, how he placed the columns along the facing found in the foundation, and he placed one column (the 127th) in the centre behind the basis, thus making the naos twice the width of its aisles.

He suggested that the thirty-six sculptured columns could be accounted for by placing them in the front rank of the ends and one at each end of the flanks, the remainder lining the central walks of the Pronaos and Porticum.

He found that the whole length of the temple platform was 109 mètres 20 centimètres, and the width 55 mètres 10 centimètres. He found that measuring from the central axis to the north and south faces of the columns in front of the antæ was the same distance practically (about 12 mètres 30 centimètres) as from these faces to the north and south faces of the outermost columns, thus dividing the façades into four equal divisions. He then showed an elevation with the height from the pavement to the underside of the architrave of this same dimension, viz., one-fourth the length of the façade. This height makes the order work out at about eight diameters. He made the entablature a quarter of this; the pediment rose another three-eighths, and with the surmounting acroteria made the proportion of superstructure to the colonnades come to as 3 is to 4.

He suggested that the roof was of tiling and timber, which would then account for the total destruction of this temple by the arson of Herostratus.

Mr. D. G. Hogarth, in proposing a vote of thanks to Mr. Henderson, said that perhaps he was the last person to have been asked to do this, because he was only less responsible than Mr. Henderson himself for certain parts of the paper. In another sense he was the right person to be called upon, as no one had seen more the assiduity and earnestness with which the reader of the paper had devoted to the work during the two seasons he was at Ephesus and for something like a year since his return. He would not venture to say much about the architectural detail which had been described, for Mr. Henderson was solely responsible for the technical detail, and the very ingenious restoration shown was entirely his own work. He might, however, say a few words chiefly from the historical point of view. Firstly, it was only right that he should lay a tribute to a very distinguished late Fellow of the Institute who was the first discoverer of the temple which had been described—he meant the late Mr. J. Wood. Of the energy and acumen which Mr. Wood showed in discovering the temple no one could speak too highly, for it was a discovery which stood in the very front rank of English archæological discoveries. Everyone had reason to be grateful to Mr. Wood for having discovered the position of the temple in a place which no one had suspected, under a covering of 18 ft. of earth. It took more than a year to trace the clue which eventually brought to light the temple. Mr. Wood did an immense service by removing the accumulation of one and a half million cubic ft. of earth from the top of the temple. Thus he did an immense service to those who came afterwards and profited by his labours. Mr. Wood was the Columbus who discovered the site, and they who followed found that a great deal of the work of clearing it had been done. Mr. Wood discovered some Hellenistic sculpture, and laid bare the temple of which Mr. Henderson had spoken. They found also that he measured with extreme accuracy the remains which he laid bare, and most carefully searched the earth which he removed. In fact, when they undertook a re-search of the removed earth, as they were bound to do, they were rewarded with practically nothing at all. As a piece of excavation in itself, considering the age in which it was done, it could hardly have been accomplished better. Of course, criticism began where it always commenced, and this was in connexion with Mr. Wood's publication, and in criticising that he was doing no more than had been done in that room by a very distinguished architect and historian. It always seemed to him that Mr. Wood never did his own admirable work justice in his publication, and that was particularly true of the early temple which Mr. Wood called the archaic temple, or, rather, his earliest temple, and which Mr. Henderson had described that night. Mr. Wood laid bare the pavement and practically all the visible remains which they had found, except at the extreme west, where he was stopped, no doubt, by the inflow of water. For some reason, which he (the speaker) had never yet understood, although Mr. Wood mentioned this temple frequently in the course of his book on "Discoveries at Ephesus," yet he never gave any plan or measurement of it, or any drawings of its details as he saw them. He did to a certain extent some time afterwards take a part in a discussion which the late Dr. A. S. Murray raised as to the restoration of certain architectural details of that temple, but, so far as the book was concerned, he ignored this very interesting early temple which he discovered under the Hellenistic Temple. It was possible that Mr. Wood might have had notes, and that had fate been kinder to him he might have published these. At any rate, the fact remained that he did not, and no notes were known to exist. The result was that, going out in 1904, their first task was to produce a plan of these remains, which were laid open between the years 1870 and 1874, but which had again been covered up with a thick growth of roots and bushes. In fact, it was a wild virgin forest, with trees growing up nearly 20 ft. high, which they had to destroy by fire. That was the great sin of omission which Mr. Wood made with regard to this temple. The other omission was that he considered this stratum of the VIth century B.C. to be the earliest, whereas there were the remains of three temples under it. As to that omission, it was practically inevitable at the time when Mr. Wood was working and the way in which he worked. He could not have provided himself with pumping machinery of anything like the strength they were able to get. With the aid of pumping every day and throwing out a small river they were able to keep the site sufficiently dry to get down to the bottom of it, but, of course, a great deal of their work had been merely groping in slime. Another reason why Mr. Wood would not have discovered these earlier temples was, as was always the case at that time, that he trusted to the method of pitting. He made round or square pits at certain intervals to see what was below. He had been digging for twenty years, and the more utterly did he reject this method of making pits. They could make them of any size they liked, but where there was a broken and disturbed stratum they could not tell what there was below. He remembered the case of Knossus. When Dr. Evans and he went out in 1900 they discussed what should be done with a certain place, and they decided to make 100 pits, and, having done so, they came to the conclusion that there was practically nothing at all to be found. They got certain fragments of stone and pottery, but they did not recognise the site as anything more than a rubbish heap which came from the Palace. Two years afterwards Dr. Evans found under that hill the Hall of the Double Axis and the Hall of Queens. He was not criticising either Dr. Evans or himself on the question of sinking the pits in the first place, because they were equally responsible for that. Well, Mr. Wood proceeded by that method when he examined the interior of the cella of the Crœsus Temple. Everything in the cella were the remains of the earlier temples. From the architectural fragments and the great treasure of nearly 3,000 objects of gold, silver, and bronze and other things which they found scattered over the area of this primitive temple he had come to the conclusion that the earliest temple was founded about 700 B.C. or a little earlier, and that most of the broken objects found there belonged to this temple, which might have lasted fifty years. After this the Samarian went away, and for his treachery was ordered to build a temple, and this was built about the year 650 B.C. Its architecture was very poor, and its foundations were of a very meagre character. He should imagine that this was only a hasty restoration, and that it did not last long, and probably it was succeeded before the year

600 B.C. by the third and last of the primitive temples, which continued till the time of Crœsus. The one certain fact they had was that the temple which Mr. Henderson had described was begun about 540 B.C., and was said to have taken 140 years to build. That was the chronology so far as he could gather of these three early temples. There was one other point. It would be remembered that Mr. Wood placed a temple between the Crœsus and the Hellenistic, but Mr. Henderson assumed that there was no such temple, and with that view he (the speaker) entirely agreed. Wood's discovery of remains upon the site was apparently a mistake, for, so far as he could see, the literary evidence did not bear out such a contention. Then as to the restoration which Mr. Henderson had shown, he himself said that it rested largely on conjecture. As to the placing of the walls of the cella, that was, of course, certain, except as regarded the eastern wall. In respect of the columns there was a considerable element of uncertainty. The columns of the high colonnade and perhaps of the façade were fairly certain, but, unfortunately, they were not sure how many columns there were at any time in the Temple of Diana. There was a doubt as to there being 127 columns, and it was suggested that there should have been a comma after the hundred, so that it should read that of 100 columns, twenty-seven were given by the kings. He was afraid, however, that that point would never be solved. A good many people maintained that the full number of columns was 100, and not 127, as Mr. Henderson had placed them, and therefore it remained entirely a matter of conjecture as to what was the arrangement in the cella, and to a certain extent the number in the Pronaos and Porticum. With regard to the height of the columns, he was very glad to think that they were no more than 40 ft. Authorities told them that the columns of the latest or Hellenistic Temple were 62 ft. high, and that was no doubt true. They had various remains which showed the great height of that temple, which was the admiration of the world, but it was difficult to believe that the Crœsus Temple was anything like that height. If they followed anything like proportion, they could not get columns more than eight and a half times the diameter of the drums; and there was another argument, which was that the earliest sculpture which ran along the parapet, of which so many interesting fragments were in the British Museum, was on a very small scale. To put that to an elevation of 60 ft. would be nothing less than a crime, and to put it even up to 40 ft. would render it indistinct. He did not think that such delicate work could ever have been put up to a height of 60 ft., and he had little doubt but that Mr. Henderson was right in giving the total height of the columns at about 40 ft. The arrangement of the sculptured bases and the arrangement of the capitals was also conjectural. It was quite possible that the volute and rosette capitals did not exhaust the forms in the temple. Apparently the Asiatic character preferred variety rather than the uniformity of the Greeks. As to the placing of the rosetted capitals in the middle and the voluted capitals at the end they could not possibly say, but, personally, he did not feel that the rosetted capitals were the more beautiful of the two. He preferred to have the voluted capitals in the place of honour rather than the rosetted, but it was purely a matter of taste. So, again, with the torus bases, which Mr. Henderson put in the centre of the façade; they had no remains of them. He hoped that the architectural members present would study this kind of detail with a critical eye, but also with a sympathetic eye, in the book which the British Museum was publishing, and which book would include all the drawings shown in the room that night. The excellence of the material and the work in the temple which had been described was very great, and was much better than in the Hellenistic Temple, which ranked amongst the seven wonders of the world. It was very curious that this temple, which was of such exquisite work, should not have had the fame of the temple which came afterwards, and which was considerably inferior in its detail and execution. It only showed that the ancient taste was affected by mere enormous size—by mere grandiosity, for apparently the chief feature of the Hellenistic Temple was a certain grandiosity. At any rate, he felt that the work they had devoted to this Crœsus Temple was fully justified, for it must have been one of the very finest, as it was one of the earliest, of the Dianic temples.

Mr. Cecil Smith seconded the motion, and expressed his entire sympathy with the remarks of Mr. Hogarth as to the work of Mr. Henderson. The excellent drawings reflected the greatest credit on the energy and industry of Mr. Henderson, and would, he hoped, provide for the students of architecture the best material that they had had for a long time for the study of the earlier period of the Ionic order. He thought also that thanks were due to Mr. Hogarth for the excellent address he had given, but Mr. Hogarth had not told them of the enormous difficulties under which this work was carried on. They had seen from several of the photographs that water overflowed the foundations when they started work, and none who had not been on the spot could realise what terrible difficulties there were. To recover the fragments of architecture and the wonderful series of gold and other ornaments now in the British Museum they had really to grope in the slime, and the result was that, in Mr. Hogarth's case, he was laid up with illness. The first important statement with regard to the temple at Ephesus was made by Mr. Fergusson some twenty-four years ago, and his predecessor in the office he (the speaker) now held. Dr. A. S. Murray, in 1895, read a valuable paper before the Institute on the sculpture and architecture of the Crœsus temple. Perhaps he might be allowed to say a few words with regard to the inception of this excavation. Mr. Wood, as they knew, finished his excavations about 1874. The site was the property of the Trustees of the British Museum, and it had always been something of a reproach to British archæology that the site had remained during so many years in the condition in which Mr. Wood left it. The Austrians made application to continue Mr. Wood's work, but Mr. Murray very rightly considered that, as the British Museum had began the work, they must finish it, and before his death he arranged with the Trustees that the excavation should take place. That was frustrated by Mr. Murray's death, but it fell to him to continue the arrangement; it was thus not before the autumn of 1904 that Mr. Hogarth and Mr. Henderson went out. He might mention that, with a view to a more complete study of the details of the architecture, he had decided on a fresh arrangement in the British Museum by which he would put on one side of the Ephesus room the whole of the Hellenistic architecture, and on the other side group the whole of what they had of the Archaic temple, so that students in future would be able to compare the similarity of the detail in the Crœsus temple with that of the Hellenistic. No doubt the public would at first feel rather disappointed that not more of the architecture had been found in these excavations to clear up the knotty points which had always existed with regard to the temple. He meant such points as the super-position of the sculptured drum on the sculptured pier, and the position and the details of the sculptured cornice running round the parapet of the temple; but when they remembered what the present state of the temple was, and that the Hellenistic architects quarried and reused the fragments of the architecture of the Crœsus temple; that on the site of the temple for many hundreds of years afterwards, certainly starting from about 262 B.C., when the Goths destroyed it, quarrying was going on; and, further, the difficulties of finding the architecture in the mass of concrete underneath the water, there was no difficulty in explaining why it was that these problems had remained up to now still difficult to solve. Unfortunately he believed that now they would never be further solved. Mr. Hogarth and Mr. Henderson he felt had done the utmost that could be done. They thought when they first started that they would be able to leave an absolutely clean site—that was, to leave the pavement of the Hellenistic temple with the remains of the Crœsus temple below it cleared for all future visitors, but that had been a matter of impossibility. The water pumped out during the day returned in the night, and it took only a moderately wet season to leave a deposit of 2 ft. or 3 ft. of water over the entire site. When the excavation was finished complaints came to the Trustees of the British Museum that there had been a considerable epidemic of fever in the district. As a matter of fact, the fever was not due to their excavations, but to the very wet season. Still, the local officials insisted that the excavation area, which was a stagnant pond of water, must be filled in, and consequently they had to do this, and so future visitors to the Artemision must not expect to see anything like the plan which Mr. Henderson had drawn, for the whole of the site had been filled in. He considered, however, that they might feel satisfied that everything which could have been done had been done, and that it would never be worth while to excavate further on the site.

The Chairman, in putting the vote of thanks to the meeting, also thanked Messrs. Hogarth and Smith. Speaking for himself, and, he imagined, for others, he felt they would have understood the paper better if Mr. Hogarth's remarks had been made first. Probably, in reading the paper with the discussion, they would be able to gather a good deal more than from just listening to the paper. One thing they must all feel was, how very fascinating such investigations must be to those taking part in them.

The resolution was carried, and briefly acknowledged by Mr. Henderson.

The Chairman announced that the next meeting, on December 3, would be a business meeting for the election of members and discussion of questions.

THE BRITISH SCHOOL AT ROME

THE annual meeting of the British School at Rome was held on Tuesday evening at Burlington House, when the chair was taken by Mr. Bryce, M.P.

The Report submitted announced the appointment of Dr. T. Ashby as director of the school for three years, and referred to the work which had been carried on by the school in the past year. Amongst the many directions in which work has been done is the study of Roman portraiture and the study of sculptures at Turin and Florence, by Mr. A. J. B. Wace; the study of works bearing on the sculptures of Damophon, by Mr. Guy Dickins; the study of villas and gardens, both of the classical and Renaissance period, by Miss N. Erichsen; the study of prehistoric antiquities, and specially to the question of the origin of the iron age civilisation of South Italy and Campania, by Mr. T. E. Peet; the study of Renaissance architecture in Central Italy, by Mr. Leslie Wilkinson; and the execution of drawings of the internal decorations of the Palazzo Massimo, by Mr. J. Whitelaw. Amongst the plans for the session 1906-7 are researches in Sardinia, and the publication of a complete catalogue of the Dal Pozzo drawings, and a further instalment of Dr. Ashby's exhaustive study of the Roman Campagna.

The Chairman, in moving the adoption of the report, said it was one which could be considered wholly satisfactory in the record of varied work which it contained, and in the prospect it held out for the future. Their relations with the School at Athens were most friendly, and arrangements had been made by which there would be an interchange of students. The School of Rome did not confine its operations to Rome itself, and it was proposed to organise a much more systematic investigation of Sardinian prehistoric antiquities in the next few months. The interest in Sardinia, although inferior to that of Sicily, was very great, and this and minor islands were full of prehistoric antiquities, and deserved a great deal more study than had been given so far. It would be noticed that they had received a small grant from the Government. It was small, but better than nothing, and as the British Academy had not received any grant they might congratulate themselves, at any rate, that a beginning had been made in recognising the duty of the State towards archæological research. They had, however, much to regret as compared with many other countries, who were their partners, and friendly rivals, in these undertakings of research. France and Germany supported their schools largely out of public

money, and the United States School at Rome was supported by grants from the American Universities, and it was in a position of comparative affluence as compared with the British School. Our Universities were, unfortunately, too poor to do anything of the kind. There was a time when the rich people in England cared for these things, and the wealthy noblemen of the XVIIIth century spent no inconsiderable part of their money in promoting studies in the fine arts. There was little of that now, and it was lamentable how little money could be got for this purpose. There was an immense field of work before them, and it was a work which was intensely interesting. Was it not a coincidence that the same age which had seen such an enormous development of new knowledge in the sphere of natural science should also be an age which had seen the greatest advance made during many centuries in researches into the history and antiquities of the earlier nations of the world? He would not pursue the analogy except to say that, whereas the interest in new discoveries in science would become fainter and fainter as time went on, because the new discoveries which were so startling now would become as familiar as the properties of steam were to us, on the other hand, the interest in inquiries into the history of the earlier nations would become greater, because the older the world got the more and more curious and singular would they appear to be, and the more lively would the interest be in the earlier stages of our own civilisation. They desired that Britain should bear her share in this great work, not from the pride of rivalry, but because they felt that they were in a true sense the children of Rome, on the ground which was expressed in the famous saying of a noble lawyer, that "Rome is the common fatherland of us all." There was no one who had not been attracted by the civilisation of Rome, and to Rome they owed so much for what was part of their own life. He would dwell for a moment on one aspect of the question, which was the value which living and studying in Rome had for the making and training of the historian. Nowhere else in the world was there so much history which could be said to lie under the eye. There had been a continuous existence of the great city and authentic records, such as could not be paralleled anywhere else. Egypt began earlier, but there were great blanks. There were records of the four periods. There was the prehistoric age which recent excavations in the Forum were helping them to know; the classical age of the Republic and Early Empire; the mediæval age; and the Renaissance age. Every one of these was a subject by itself; every one was an illustration of the history of Europe at the time; every one threw light upon the others, although, in a sense, complete in itself. He could think of nothing better for the young historian and anything more calculated to form his mind and lead him to an understanding of its unity and diversity than living and studying in Rome.

The Italian Ambassador seconded the adoption of the Report, and it was carried.

Mr. A. H. Smith gave an explanation of the modern inscription, "Aesculapio Tarantino Salenius Arcas," which is on a relief in the British Museum. He suggested that "Salenius Arcas" was a member of the Academy of the Arcadi, probably Gregorio Massere, the Hellenist, commonly known as "Il Salentino," and that the "Aesculapius" of Tarentum was one Cataldo Antonio Mannarino, a physician of Tarentum, a pastoral poet and great-grandfather of Gregorio Messire.

Mr. H. Stuart Jones (late director of the School) gave an address on "Notes on the Reliefs of the Column of Trajan," which was illustrated by lantern slides. His object was to show that the theories of Paterson and others, founded on their reading of the reliefs on the column, as to the route taken by Trajan in his two wars against the Dacians in 101-102 and 106, were open to question. He pointed out that, until casts had been taken of the whole series of reliefs of the column, it was impossible for historians to derive any satisfactory result in regard to historical interpretation. When Napoléon caused casts to be taken it was possible for archæologists to treat them as a historical document, and in recent years the production of the whole series photographically had enabled anyone to treat the monument historically. At the same time, he did not feel that the subject had been exhausted. Evidence from literary sources showed them that Trajan waged two wars in Dacia, and in the first war of 101-102, they knew that he pursued the westernmost route. It had been held that in the first war Trajan's army was in two columns, and the relief which showed the Romans crossing the Danube was pointed to as proof of this. He could not see, however, that the relief afforded any clear evidence of the fact. It was true that the relief showed two columns crossing the Danube, but, to his mind, the two bridges of boats were obviously intended to be parallel and close to each other, and he could see no attempt to indicate that a distance of 100 miles separated the two columns. Paterson held that the junction of the two armies took place just before the battle, and that the juncture was shown in another relief, but here again he could see nothing to represent that the Guard of the Legions had just joined forces, and, in fact, the exact opposite was shown to him. In the second campaign a convergent march of two armies was undoubtedly shown, and he thought they were justified in asserting that, at the time of the second war, the whole of Dacia remained to be conquered. His reading of the reliefs was that Trajan himself crossed the Adriatic to Sissus, and proceeded through modern Servia. It had been previously held that the reliefs illustrated the progress of Trajan along the Italian coast of the Adriatic, but the Roman fort, depicted at the landing of the army, led him to the belief that Trajan must have crossed the Adriatic.

RECONSTRUCTED LIMESTONE.

THE invention of a process which converts the waste *débris* of any good limestone into blocks of stone possessing greater strength and density than the natural stone, and which effects this without changing the chemical composition of the stone, is one of the most recent achievements in the domain of applied science.

The process consists in heating a portion of the waste limestone to the temperature at which it is decomposed into quicklime and gaseous carbon dioxide, and converting the latter into liquid carbon dioxide. The lime is then mixed with a certain proportion of the ground limestone which has not been heated. The mixture is then slaked, and subsequently pressed into slabs or any other desired form. It is next placed in a hydraulic press, and then taken to a drying room to expel moisture, and finally it is treated in a cylinder with the carbon dioxide originally extracted from the limestone. Thus it regains its original chemical composition.

We should have expected to find that by this treatment some free lime remained in the interior of the reconstructed stone, owing to the inability of the carbon dioxide to force its way into the compressed mass, but the analytical report of Mr. Gregory, a copy of which has been forwarded to us, shows that the proportion of carbonate of lime in the reconstructed stone is quite as large as in the natural stone.

Judging from the samples of reconstructed Portland stone, Bath stone, lithographic stone, and marble submitted to us by the Lithographic Stone and Marble Company, Ltd., the stones appear to be in every way equal to the natural stones, and it is an advantage that they can be moulded in almost any size or shape during manufacture.

We should have thought that the cost of the process would have prohibited its use for the reconstruction of such stones as Bath stone and Portland stone, but no particulars as to prices have been placed before us.

WEASENHAM CHURCH.—The parish church of All Saints, Weasenham, in Norfolk, has been restored, refurnished, and reseated in oak, under the directions and superintendence of Mr. R. Creed; a new font and new organ have also been presented to the church. The church is built for the greater portion after the later English style; the tower fell down when the church was shortened at the west end about 250 years ago, and a belfry was afterwards made in the south porch, which was raised in height for the purpose.

EDINBURGH, OLD AND NEW.*

WHAT of our city and its work fifty years ago? Though to one moving with the growth of the city the changes in fifty years may not be very noticeable (just as the yearly growth of a tree is not apparent, unless annually recorded), yet the increase and expansion of the city and its industries are very apparent. Princes-street, the North Bridge, Lothian-road, and Shandwick-place have had their frontages, as in 1858, almost entirely changed, either by new faces super-applied on the old, or by entirely new creations, in substitution of the old. Taking Princes-street, East-end, the old Theatre Royal and Shakespeare-square have been entirely obliterated, and their places occupied by the General Post Office. The North Bridge of 1761, with the buildings at the south and north ends, has given place to an entirely new structure in iron, with modern commercial buildings at the south end and the rich pile of the North British Station buildings at the north end. The old Edinburgh, Perth, and Dundee Railway (which few may remember), with its tunnel to Scotland-street, is now occupied by the uniquely-devised covered Waverley Market. The old primitive open-air market, with Canal-street, and a host of other interesting minor thoroughfares, with their quaint XVIth century residences, have yielded to the claims of the North British Railway Company to form its station, now covering 27 acres—the largest in Britain. The East Princes-street gardens, for many years a free Toom, are now trimmed to afford flower-bordered walks and spaces for quiet recreation and are adorned with a display of horticultural achievements perhaps unsurpassed in any modern city. The West gardens, no longer the neglected private pleasure ground of the opposing proprietors, are now the admirably trimmed and attractive retreat of the leisured citizens and tourists, and we may thank God that whatever changes may affect other parts of the city, this one place, at least, has been preserved to us, where nothing can block out the beneficent sunshine. Of the original tenements in Princes-street very few remain, nearly all having been supplanted by palatial commercial edifices, that reveal the increasing wealth of the citizen owners, through whom the valued rental of the city has been in fifty years increased at least fourfold. Shandwick-place is no longer a street of private residences, its entire length on both sides having been converted to business premises. The Lothian-road and Castle-terrace, with minor exceptions, were, in 1860, fronted with ungainly, temporary erections of timber and brickwork, screening, so far as they could, backyards of engineers, carpenters, masons, and such like industries. Railway enterprise at the West-end has made great strides since then; for, instead of the grand though obtrusive pile now representing the Caledonian Railway Station Hotel, there was, up to about thirty years ago, a very insignificant rectangular block of buildings at some distance back on the west side of the Lothian-road (where the goods department is now seen), and which did duty as a passenger station terminus and ticket office. Nearly opposite the St. Cuthbert's Church, on the present railway ground, existed "Poor House-lane," with Dr. Candlish's Free Church on one side (which was taken down and re-erected at Stockbridge), and on the other side a very popular and spacious riding-school, with the St. Cuthbert's Parish Poor House behind. These have all given place to the great cormorant of the age—the railways.

At this part of the Lothian-road a very simple, but exceedingly valuable, improvement was effected under Lord Provost Law about 1869, namely, the filling-up, by about 14 ft., of what was then a heavy valley, opposite to St. Cuthbert's Church, to ease the gradient for the great traffic daily increasing there. For this great improvement all the buildings on the ground where now the hotel stands had to be cleared away.

The additions to the number of the city's buildings have been numerous, especially those of a commercial, educational, and residential character. Probably at no previous period has the residential section especially increased so rapidly over the suburbs as it

* Part of the Presidential Address delivered by Mr. Hippolyte J. Blanc to the Edinburgh Architectural Association on the 14th inst.

has done since 1870, when the Tramways Company extended facilities to the outskirts of the town.

Tramways have now been laid to an aggregate length of nearly twenty miles, now entering every available artery.

New educational institutions, including over forty new Board schools, now afford teaching to upwards of 60,000 children. In all, during less than fifty years, nearly 150 public buildings have been added to the city, one-half being churches.

The new infirmary, convalescent home, retreat for incurables, for sick children, for infectious diseases, for the blind and the poor, with many other liberal endowments, have been promoted and completed during the past fifty years. To the sum of these we may add the great luxuries of libraries, bathhouses, and electric lighting.

In all these advances architecture has not declined, and in the rapid marches of sanitary science the profession has proved its fitness to handle the details expertly. Whatever may be the future development of the city, it should be made a matter of first importance that the main routes should be direct and wide enough for the increasing numbers of modern speedy conveyances. Pavements in these routes also are required to be much wider, to avoid the unseemly jostling experienced every day in our chief thoroughfares. Tree-planting in streets, in our links, and in the squares should not require more than mention.

This is a commercial age, in which architectural expression under dictation is, in some instances, compelled to be mean, and in others to be richly florid, even sometimes intrusive. To the architect, who is a scholar, the preparation of a design for either condition offers no problem. A building can be made to look acceptable, though plain, if its forms are in harmonious proportions; so also can a building be designed richly if the decoration be judiciously applied upon a well-proportioned body. Architects should, therefore, go with the spirit of the time, though in a thoughtful and scholarly manner, and not be led into some of the distorted expressions of modern eccentricities, which, however pleasing as novelties, have a very ephemeral attraction. To the well-informed such works soon reveal that they are against all the necessary rules, founded on the very nature of true construction. Before the steady march of commerce, however, sentiment must give way; but to infuse a fair proportion of sentimental treatment in commercial architecture is not incompatible with the requirements of commerce. Whoever, therefore, disregards this sentiment is not acting wisely in the best interests of the city.

For its size there are few cities which possess so many good examples of pure architecture as Edinburgh. The sites of many buildings have undoubtedly lent inspiration to the designers; but, apart from this circumstance, the last century was fortunate in having architects whose scholarly skill and taste were equal to the poetry of the situations. The student of to-day may therefore be congratulated on having before him, in his daily walks in this city, opportunities of educating his tastes, by making himself familiar with those specimens of masterful proportion and detail.

Compare the thoughtfulness exhibited in Craig's and Ainslie's plans, prepared soon after the opening-up of the northern fields of the city for feuing, when the Nor' Loch was spanned by the North Bridge, with the utter disregard of all amenity in the disposition of Morningside-road, Dalry-road, and a few others. Why should the private interests of individual proprietors control the amenities (and often destroy them) of streets and roads, which ultimately fall upon the body of ratepayers to use and maintain? Why should not the magistrates have greater control in the genesis of such streets?

When the problem of laying-out the new town, partly upon the mounds of the Calton Hill and the slopes of Broughton, with the lands of Wood and Moray, towards the west, was under consideration, it was prudently determined to submit the whole scheme for the suggestions of architects. The result justified the resolution, and if Edinburgh had nothing else to show them, the very successful and dignified classical compositions in the squares and crescents of the "new town," it had enough to justify its claim to be considered a truly classical city. The union of interests of coterminous proprietors then secured enabled the architectural blending of Heriot-row, Great King-street, Moray-place, Great Stuart-stret, Randolph-crescent, etc., to be accomplished, as it could not have been had not the wish for continuity of effect between coterminous proprietors been made indispensable.

Those works were projected in the early part of last century, when the fashion of architectural practice was academic and scholarly; and, though to many the result may seem dull and cheerless, the restfulness of such compositions is valuable and educative in a city. The later city extensions have been chiefly southwards, and the movement has been rapid. Instead of the fine streets and squares, the new extension has taken the form of gardened residences, the distinguishing quality in which is that, from a sanitary point of view, they are in advance of their predecessors in the "new town"; but of architectural character they are mostly thoroughly devoid. Increasing industries and population have demanded tenement residences. These have been in some main thoroughfares planted stretch after stretch, painfully close, following the original irregular line of roadways without the slightest engineering. The resulting effect is anything but elevating to the resident or the passer-by.

Why should streets be so closely aligned that opposite neighbours should be enabled to see through each other's windows, and, at the same time should make the narrow streets prematurely dark by the shadows of the high tenements placed on each side? If in Paris, under modern legislation, streets can be made from 150 ft. to 200 ft. wide, affording facilities for every sort of modern traffic, and for broad pavements fringed with trees, is it necessary that the extensors of a city like Edinburgh should be laid out as a series of windy lanes? Edinburgh, on account of its hilly ground, demands even wider avenues than do cities on level plains. This is purely a citizens' question, and, as guardians of the citizens' interests, the magistrates now alive to the necessity may fairly be looked to to protect those interests. If the intramural living conditions were improved, might there not be less necessity for providing large sums for extramural recreation grounds?

Having regard to the irreparably poor appearance of the Morningside-road approach to the city, also of the Dalry and Gorgie roads, it may be hoped the Corstorphine, Queensferry, and Newington approaches may be kept broad, and guarded against the intrusion of anything affecting their present amenity such as would result from the closing in of tenements. We may take suggestions from the specimens of the 'new town," and a lesson from the experiences of London and Paris (especially London), where enormous sums of money are being expended to bring back the amenity lost in a previous age of culpably careless administration.

We read that the Emperor Nero was desirous of having Rome laid out on the modern lines of that time, but was opposed by the owners of private properties and the sacred rights of temples. To attain his end, however, he fired nearly three-fourths of the city, and had his wishes carried out in the formation of new streets and squares, on which he had placed important monumental buildings where former restrictions hindered him. The means were extravagant, but the end was desirable. Prevention, however, is better than cure. To prevent injury to amenity is in our power now. As in the case of all cities, suggestions of new schemes for improving the city's amenity are continually being made. Princes-street and the Calton Hill are perennial themes for the busy mind ever on the look-out. It may me asked, however, with regard to the Calton Hill, can the picture, as we now see it, be made more beautiful? Does not the openness of the screen formed by the unfinished National Monument appear more pleasing to the eye than would be a colossal solid building abruptly terminating the vista. The picture, at present, is unique, with its charming play of form and colour effects. Already we have an unpleasing effect at the west-end of the city, where the mass building of the Caledonian Railway Station Hotel so completely blocks out all hope of perspective. The National Monument on the Calton Hill seems more picturesque as it is, and may be left so until ample means and some useful suitable appropriation can be found for it.

Leith-street sorely wants improving and widening, but Waterloo-place and the tasteful compositions at its approach (suggested by someone to be altered) should remain as excellent types of street architecture, carefully and scholarly thought out.

One of the latest suggestions, that of forming a terrace, or boulevard, on the south side of West Princes-street, is now under consideration. Very wisely, a model has been constructed, that the citizens may judge the effect. This is a most intelligent act, and is one such as is adopted in France and elsewhere when important schemes have to be tested. The proposal, however, has not taken—and doubtless wisely. There is more involved than can be judged from the model. At present we have, at the East Gardens, a broad terrace, adjoining Sir Walter Scott's monument, beautifully parterred and fairly well taken advantage of by the public. It composes well with the vertical masses of the building opposite, to which it seems to form a suitably approximate base. In the West Gardens the conditions are different. The gentle fall from Princes-street Walk, and the gradually ascending castle bank opposite, with the broad valley between, form a unique picture which can be appreciated only as a whole, not only by the leisurely, but by the ordinary passer-by. To cut off any of the picture, as seen from Princes-street, would destroy it, and the contraction of the valley by the intrusion of the continuous stretch of terrace wall, as seen from the lower walk seems very undesirable. A few feet in addition to the present Princes-street Walk, and a more dignified railing, would be an improvement, and at much less cost. The promoter of the scheme deserves credit for his public spirit, and should he not succeed in persuading its adoption, he must be consoled by Sir Walter Scott's note to a friend, in 1826, in which he says: "The walks of the West Gardens have been conducted in good taste, though Skene" (of Rubislaw, who arranged them) "has undergone much criticism, the usual reward of public exertions."

Princes-street—the most valuable in the city—is fast becoming what the city was forced to be when confined within the cramped environments of the Flodden Wall—one of lofty tenements. Its limit as a commercial street has almost been reached. How can it extend? Waterloo-place at the east end offers no opportunity; the Lothian-road, with its constriction at Earl Grey-street, is not promising; and the west end at present offers nothing beyond Shandwick-place. Could not the present thoroughfare towards Haymarket be interrupted, and the ground occupied by a building of the nature of a concert-hall? By diverting the traffic to Coates and Atholl crescents on each side there would be afforded considerable scope for the commercial expansion of the city westward.

An analogous instance is at St. Paul's Churchyard, London, though on a larger scale. This arrangement was suggested, among many proposals, for a site for the Usher Hall. It has the strong recommendation in its favour that it offers what seems so indispensable to a site for a concert hall—openness on all sides.

But of this Usher Hall subject it is difficult to speak. So much has already been said and tried that one would fain leave the matter at its latest stage, were it not for the pressing fact that a gift of such magnitude should have the most favourable conditions of site secured for it. Of nearly twenty concert halls I have visited on the Continent, I found that nearly all are placed where free access on the four sides is obtainable for vestibules and egress staircases. The site acquired does not, unfortunately, afford this—a *sine qud non*. The acquisition of it, moreover, has attached to it an undesirable requirement, namely, that an existing good and useful hall would have to make way for the new.

In considering such matters as the placing and designing of public buildings regard should be had to the surroundings and the possibilities of the site. The late David Bryce used to say that no one should attempt

designing a public building unless he had "slept on the job." To have solved a great problem, and to have produced such a masterful work as the Bank of Scotland by any other mode would seem to have been well-nigh impossible.

But fifty years ago, and further, all the important buildings in the city were by townsmen (Hamilton, Playfair, Rhind, Bryce, Graham, and others), who thoroughly studied the sites they had to work upon. Each of these architect's works are marked by a scholarliness, artistic fitness to the surroundings, and classic dignity. Nothing can surpass the masterly appreciation of sites expressed in the refined and most artistic composition of the Royal High School, contrasting so well with the rugged rocks against which it nestles. Nothing, to my mind, in this city approaches it, as a perfect poem in architecture. The Burns Monument, sweetly perched upon an adjoining knoll, is also picturesquely placed, a welcome factor in the general picture. If we examine the Calton Hill we cannot fail to read how successfully the problem of the site has been solved in the disposition of the Regent and Royal Terraces. Like many others in the city, it shows to have received very careful consideration. St. Stephen's Church, another instance of skilful planning, has always seemed to me to occupy its site well. The church façades winging out to fill the angles of the branching streets, and the robust tower sternly arresting the eye as we descend the slope of Howe Street, and relieving it from straining into vacancy among the fields beyond, have often struck me as a nobly thought-out scheme. The men who did these works evidently considered the city as a whole, not merely a spot on it. What are we as architects doing in this direction?

Before quitting the necessarily brief reference to our city, may I intrude one word in regard to the most recent compliment paid to the city by a generous donor. I refer to the legacy of a large sum of money for preserving and rendering serviceable the interesting old chapel of Holyrood. The gift of Lord Melville and Leven is one that is certain to appeal to the best sentiments of the citizens of Edinburgh. No sooner is the gift announced, however, than a crop of suggestions and opinions are daily served up in the morning press, some welcome, many not. Are not architects yet capable of dealing themselves with matters entrusted to them? Does the medical profession receive from the public budgets of anonymous correspondence when any member has a case to treat? I fail to see the difference.

Now what is the risk of all this premature criticism. It will undoubtedly restrain the hands disposed to give, with the result that the city will be poorer by being deprived of the chances of increasing its real attractions. No declaration has yet been made by the architect, Mr. Thomas Ross, in whose hands the subject is placed; so, therefore, we have nothing before us. The gift, however, as a national one cannot be over-estimated. The history of the chapel is a sacred one. It seems desirable, therefore, to do whatever is possible with sacred handling to save the building from its obvious fate. Total decay will within a very limited period certainly overtake the building if the inestimable opportunity is not now taken to arrest it. In our day much has been done by way of "restoring," and in most cases (though not always) with advantage. Increasing intelligence and wider knowledge are playing a helpful part. But the occasional bursts of antagonism are unhealthy, as much so as is the other extreme of over-zealous reconstruction. Each building must receive the special consideration it requires, and, if it can be shown that wasting and disrepair can be rectified, and the building can be made serviceable by retaining all it possesses of original material, and by having the gaps filled in, there seems no reason why this should not be done? Holyrood Chapel seems to me to present such a case. Who having his garments rent or the means of attachment wanting would not try "to gar the auld things look a'maist as weel as new." The French do more wisely, for at Dijon, last spring, I witnessed the shoring up of one side of the Cathedral nave and the entire renewal of two of the heavy clustered piers, which had gone out of the plumb and were wasting.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A METROPOLITAN district meeting of the Association of Municipal and County Engineers was held at the Institution of Civil Engineers, Westminster, on Friday, November 16, when Mr. T. C. Horsfall, of Manchester, gave an address on the planning and control of town extensions in Germany. Mr. W. Nisbet Blair, St. Pancras, Vice-President, occupied the chair, in the absence of the President (Mr. J. Patten Barber), and there were present Mayor Isaacs, Kensington; Messrs. W. Weaver, London; J. Lemon, Southampton; T. W. A. Hayward, Battersea; A. H. Campbell, East Ham; A. Giles, Westminster; Assistant Secretary Newton, Paddington; A. Harrison, Southwark; F. R. Durham, Westminster, J. Rush Dixon, Woolwich, and many others.

On the proposition of Mr. W. Weaver, Mr. J. Rush Dixon, of Woolwich, was unanimously re-elected Honorary Secretary of the Metropolitan district.

Town Extensions in Germany.

Mr. T. C. Horsfall, of Manchester, then gave an address on the planning and control of town extensions in Germany. He said that in the long periods in which the two movements of population had been taking place in this country—the movement from the villages and small towns into large towns and the movement from the central districts of large towns into the suburbs—similar movements had also been taking place in Germany. But though the movements had been the same in kind, there had been considerable difference in degree. The population of the large German towns had increased in higher degree than had that of our large towns, but the movement towards suburbs had been less marked in Germany than here.

But the greatest difference that had to be noted between the two countries in connexion with the movement of population was in the nature of the new districts which had been built to receive the increase of urban population. In this country vast areas, on what were a few years ago the fringes of our towns, had been covered with new streets, nearly all of them narrow, which lie between long rows of small houses all very much alike. In most of these new districts very little vegetation existed; from the windows of the great majority of the houses in them no trees or flowering plants were to be seen; and though most of our large towns had provided in the new districts a park or parks, which, as a rule, were kept in an excellent and most attractive state, the immediate surroundings of the majority of the houses were so devoid of all that could create and keep alive desire to see beautiful things in the majority of the inhabitants that the parks were not only distant in space, but were also remote from the thoughts and feelings of most of them. In our new suburban districts there was also a great lack of playgrounds for children. We all know that in the districts in question there was so little to facilitate the living of a full and healthy life that the aid of the public-house, the music-hall, the betting agent must be almost as welcome there as in the older parts of the towns; for men and women would have some change from the sensations created in them by monotonous work, and if they could not get it, as many of them were willing to do in the occupations made possible by the existence of the beauty of nature and of interesting human productions, would seek it in the use of alcohol and other dangerous ways. Of the author's own beloved town Mr. Justice Day had said that it was no wonder that cases of drunkenness were common there, as to get drunk was the shortest way out of Manchester.

The new districts of German towns were so constructed that a stranger often could not tell when he passed through one of them whether it was inhabited chiefly by rich or by poor people. Nearly all the streets were wide, many of them were planted with trees; there were many small open spaces, made attractive with plants; public buildings were so placed as to add interest to as large a proportion of the district as possible. The tree-planted street was considered of so much importance that the *Statische Jahrbuch deutscher Staedte* always contained a table which told not only how many parks a town had, but also how many tree-planted streets and the total length of such streets. Thus they learned that Coeln, which had about 375,000 inhabitants, had 285 tree-planted streets, the length of which was 64½ miles, and that the manufacturing town of Elberfeld, which had 157,000 inhabitants, had 27 tree-planted streets 19 miles long.

It would be difficult to overstate the value to the inhabitants of German towns of such places and of tree-planted streets. Large numbers of parents resorted to them on summer evenings, and on Sunday evenings with their children, and while the children played in almost complete safety the parents rested on the benches provided by the town. His attention was drawn to the high value of planted streets and open spaces many years ago by the statement made by one of the London coroners that he held, on an average, more than fifty inquests a year on children killed while playing in their only playground—the street; and he had, therefore, ever since tried to find out, when he had been abroad, how foreign children fare in respect of the chance of playing in safety.

The chief reason for the very great difference between the new districts of German towns and those of our towns was that German municipal authorities in common with those of every other civilised country except our own and perhaps the United States had the power to control the growth of their towns by making town extension plans, the arrangements indicated on which must be complied with by all owners of the land which was within the boundaries of the town, and by all who build on it. In Prussia the power was formally given by a law, passed in July, 1875, known as the Street-lines and Building-lines Act, but the power had been exercised for a long time before that Act was passed.

It was the few words "lines can be laid down for single streets, or parts of streets, or, to meet the foreseen needs of the near future, can be laid down by means of building plans for larger areas," which give German municipal authorities the power to save their people from the degredation which our suburban districts are bringing on ours. These words had received a very large interpretation. The foreseen needs of the near future were taken by the most enlightened authorities to mean the needs of the next twenty or thirty years, and hence building plans were sometimes made for very large areas. A few years ago the Municipal Authority of Düsseldorf published a plan for an area of nine square miles. The words were held by most of the authorities to give them not only the power to decide what streets shall be made, what shall be the width and direction of each, what squares, small planted open spaces, playgrounds, and parks shall be provided, but to give them also the power to create different zones or districts—districts for dwellings, districts for manufactures—each with building regulations differing from those of other districts. This power had been largely used, and with extremely good results.

The building plan was prepared by officials who had received the training of surveyors, and whose experience gives them some knowledge of engineering and of the tasks of the architect. These officials always, he believed, work under the supervision of a committee consisting of men cognisant of the various interests which had to be taken into account.

Land was held by far more persons in Germany than in this country; the plots held by many persons were small, and many of the plots had been strips of a few furrows in width which had been left by farmers to their children. These plots, being long and narrow, could not be used separately as sites for buildings, and therefore when a building plan was published by a municipal authority many sales or exchanges of property were needed before building could take place. In order to quicken this difficult process Dr. Adickes obtained the passing of a law, which was known as the Lex Adickes, which was at first intended for the whole of the Prussian Kingdom, but which was eventually restricted in its application to the town of Frankfurt. It enabled the Town Council to expropriate all the land in a new urban district temporarily, to deduct from the whole the land needed for streets and open spaces, and finally to redistribute the residue among the original holders in plots of shapes suitable for building purposes, each owner

contributing land in proportion to the value of his original holding.

German towns suffer far more than ours do from high rents and from the inevitable result of overcrowding of dwellings. While the evil of overcrowding in this country was felt, as a rule, only by the poorest class, in Germany a large number of persons of the middle class were compelled by the dearness of houses to occupy inconveniently small dwellings. To enable municipal authorities to remove or mitigate these evils the Governments of Hessen and Saxony had passed housing laws in the last few years which had already lessened the evil of overcrowding in some parts of those two countries.

The new Prussian Housing Bill proposed by building by-laws to regulate—

1. The graduating by districts, streets, and squares of the extent to which sites shall be covered by buildings.

2. The separation of particular districts, streets, and squares in which the erection will not be allowed of buildings which are likely, in working, to cause the neighbouring inhabitants or the public danger, injury, or annoyance by diffusing bad smells, thick smoke, or unusual noise.

3. The plastering, painting, or pointing of buildings mainly serving as dwellings and of all buildings situated on streets and squares.

4. Proceedings against buildings which disfigure the streets or public places in towns or country places.

The German Governments, and all German students of the housing problem, know that towns can not be brought and kept in a condition which shall make it possible for human beings to have good health, physical, mental, and moral, in them solely by means of the town building plans and of the building regulations which form part of such plans. They believe that Town Councils must own much land, and for this purpose must have the right to buy it whenever they can get it as private persons may. They are convinced that every house containing small dwellings, and the servants' and apprentices' rooms in large houses, must be carefully inspected at not very long intervals of time; that co-operative and other societies must be encouraged to build wholesome small dwellings by being provided by direct or indirect aid from Government, with loans of money at low rates of interest, and that Town Councils must be enabled to obtain a considerable proportion of the money needed to defray the cost of making towns habitable from the persons who now gain most by the growth of the towns, by being empowered to rate land on its selling value and levy rates on unearned increment. Legislation for all these objects has been already passed by several Governments, and is promised in the near future by the others. But while the importance of all these other things is admitted by all German social reformers they all know that the supremely important thing is the building plans. In all lists of the measures needed to ensure that towns shall be made less dangerous to health and strength than they now are the improvement of the building plan and its necessary concomitant building regulations has the first place. No one connected with a German town, rich landowner, or poor landless tenant doubts that it is necessary for his welfare that such plans shall exist. In Professor Baumeister's book on the enlargement of towns the English towns are mentioned as the only modern examples known to him of the monstrosity of towns built without any plan at all. He trusted that our towns would soon cease to have this evil distinction.

The Chairman proposed a vote of thanks to Mr. Horsfall for his paper. He said the paper opened up a field to them which was almost inconceivable in the matter of dealing with land. Powers existed in Germany which certainly did not exist here, and which they could hardly anticipate coming into effect in our time. In England it practically rested with the landowner as to how he would lay his land out. He worked independently of the adjoining owner, with the result that they made streets which deliberately missed, instead of forming, a direct line. The cost of course was one which could not be lost sight of when hearing of these immensely wide streets. They had not heard where the cost came from. The owners of the land who had given up their possessions were given back something which Mr. Horsfall told them was equivalent to what they surrendered. But there still existed a very large area absorbed by the streets which must come apparently out of the public funds.

Mr. A. H. Campbell, East Ham, who seconded, was glad Mr. Horsfall had laid such stress upon the planting of trees. Trees did more than anything else in a simple and inexpensive way to break down that dreadful monotony of bricks and mortar which was such a nightmare to many of them. It was unfortunate that the Public Health Act of 1875 and all the amending Acts had not conferred upon local authorities power to charge for the planting of trees as an improvement work. He had no doubt with the enlightened, energetic President they had now in the Department which controlled these matters there would be incorporated a clause in the Act which would empower the planting of trees by the statutory authority as part of public improvement work. In the last eight or nine years East Ham had planted 8,000 to 9,000 trees, which covered a mileage of 25 to 30 miles, and it had now become so appreciated by property owners and ratepayers that they had no difficulty in getting them to voluntarily contribute to the cost. Another matter which Mr. Horsfall had spoken of was the better inter-communication of roads which linked up different districts. There was such a variety of separate local governing authorities in London that it was difficult to get proper inter-communication through such a maze of streets. He hoped the next Public Health Act would include a compulsory clause giving local authorities some measure of control to accomplish this result. With the help of public-spirited men like Colonel Burgess, Sir John Bethell, and others, they had been able to lay out in East Ham many arterial lines of highways, and they were endeavouring to arrange by persuasion that all the building developments on these arterial lines should be subsidiary to and serve the main lines laid out on the plans. He was glad to say that was in a fair way of realisation. He was persuaded that in all our large towns, if the council and officers could apply themselves to that object with determination, a good deal could be accomplished even without the arm of the law to support them. They had heard a good deal about the enterprise and progress of Germany, yet even in Great Britain they had evidence of progress on similar lines, although perhaps not applicable to the service of districts which were inhabited by the artizan and labouring class. He instanced the new town of Edinburgh laid out 70 or 80 years ago by Mr. Playfair as a remarkable case of town planning. Then Hove, for wide roads, was one of the best examples of laying out on progressive and advanced lines.

The vote of thanks having been adopted, the address was discussed.

The Mayor of Battersea was of opinion that there were too many local authorities in London. If they had fewer local authorities and a central body with greater powers they might work on the lines proposed in the address. He considered the moral of the address was the State ownership of land for the proper carrying out of this movement of town planning. He held that the Acts they worked under in London should be consolidated, and that districts and streets should be laid out not for the interests of the few but for the interests of the people who had to occupy the land.

Alderman Thompson, Richmond, Chairman of the National Housing Reform Council, said they urged very strongly that there should be a central authority with very complete power over land and housing and transit—these three things being so intimately connected. He believed in the Public Health and Housing Bill of next year they would get power to control the lines of main roads. He suggested that they should adopt the German plan for dealing with the land and the English plan for dealing with the houses.

Councillor Andover, Paddington, said as Chairman of a public health committee he would be only too delighted if they could develop their streets with trees. If it could be done in Germany, he did not see why it could not be done here.

Mr C. H. W. Begg, London, said he was too much of a cynic to believe they could get one half of the things which had been hinted at that night. What he wanted to hear was that there should be a definite proposal which might be handed to the Local Government Board or Parliament, that towns should be extended by definite plans, and that so far as main thoroughfares were concerned they should be determined at all costs.

Mr. F. Durham, Westminster, said that having had twelve years in Frankfurt and other German cities he desired to reply to Mr. Horsfall, who had taken a too optimistic point of view as to Germany. Speaking with a good deal of experience, he asserted that the English working man had a good deal more happiness than the German. This was confirmed by a German friend who came over recently to study workmen's dwellings. He came over prejudiced against everything English, and after three months said: "We are sixty years behind this country in the treatment of working men, hygiene, and everything else." The principles which had been commended to them as coming from Germany originally came from England. In 1842 a very disastrous fire occurred in Hamburg, and an English Engineer, Mr. L. Lindley, was called in to sewer and relay out the town, and he laid it out on the broad principles on which towns should be laid out, with wide streets and open spaces. Mr. Lindley advised Frankfurt, Düsseldorf, and other towns, so these ideas of town planning were brought from England to Germany, and had been developed there. Germany was a military nation and Germans always waited to be ordered.

Dr. Lyon, London, said that at present a zone of houses was built near the country. There was plenty of land outside. Then another zone of houses was built outside and made the first zone uninhabitable. They became a collection of dwelling places in which it was not fit the human child should be born and brought up. The remedy seemed pretty simple. A fund should be formed to provide open spaces and proper wide streets, and the owner of each house built should subscribe to that fund a sufficient amount to meet the cost.

Mr. J. Lemon, Southampton, said the conclusion he had formed from his visit to Germany was that German towns suffered more than English from high rents and overcrowding. He admitted some controlling influence was necessary in order that our main roads and arteries should be laid out on a proper plan and not in a higgledy-piggledy way. To have that they must give up their parochial ideas and consent to some form of centralisation. That did not go down with certain people. Nothing offended local bodies so much as a controlling authority. The County Councils had power to regulate main roads; they ought to have greater powers in the laying out and controlling of new streets to be made. That would not require a great deal of legislation to bring about. The landlords were not such a bad lot as some people thought they were. Where a landowner had control of a large area of land there were many instances where he had laid it out to great advantage. He instanced Folkestone, a beautifully laid out town; Eastbourne, controlled by the Duke of Devonshire; and Newcastle-on-Tyne.

Mr. Gladwell, Eton, wondered whether the old Enclosure Acts could not be extended to meet the case. If they were to take particular areas of land there were numerous owners that could be brought within the provisions of the Enclosure Acts, and Commissioners appointed to redistribute the various areas of land, reserving for public purposes such land as would be required under a comprehensive and intelligible plan.

Mr. T. C. Horsfall, in reply, said the movement from the centre to the suburbs had been less marked in Germany than in this country. The most intelligent of the working men were removing from the centre, the semi-slum districts, because they found a satisfactory family life was impossible, to the suburbs where they found the same semi-slum conditions were being again set up. He was assured that in the poorest districts of Berlin where the overcrowding was most serious the people had more of family life

than the residents had in the poorest districts of Manchester and Liverpool.

The usual votes of thanks were then passed, and light refreshments were served in the reading-room.

THE EASTERN COUNTIES MASTER BUILDERS' FEDERATION.

THE half-yearly general meeting of this Federation (affiliated to the National Federation of Building Trade Employers) was held at "The Shaftesbury Hotel," Culver Street, Colchester, on the 9th inst.

The minutes of the last half-yearly general meeting were read and confirmed, and the financial statement of income and expenditure from Dec. 31, 1905 to date was received and adopted; and the secretary was instructed to urge local secretaries to forward at once all outstanding subscriptions for the current year, arrears, and contributions to the National Reserve Fund.

The following elections were made for the coming year :—

Representatives on the National Federation Executive Council :—Mr. C. Kerridge, President (Cambridge), and Mr. J. S. Smith (Norwich).

Representative on the National Federation Administrative Committee :—Mr. C. Kerridge, President (Cambridge).

Representative on the National Federation Conciliation Board :—Mr. C. Kerridge, President (Cambridge).

The half-yearly report was read and adopted. It is substantially the same as the report of the Southern Counties Master Builders' Federation, which was printed in our last issue, page 508.

The President addressed the meeting at length, drawing attention to the various objects of Federation, and urged upon his audience the necessity of employers putting themselves in such a position as would enable them to hold their own with organised labour. References were made to the different Bills now before Parliament relating to the building trade.

Mr. A. G. White (Secretary, National Federation) also addressed the meeting on organisation, and he asked the meeting to allow him to suggest the approval of the following resolution, which was passed at the recent Conference of National and Local Secretaries :

It was resolved :

That the Secretary be instructed to ascertain the views of the members of the Eastern Counties Federation as to the principle involved in the following Inter-Trading Rule :—

"Members shall not give or take tenders for any work to or from any persons who are not members of this or kindred associations connected with the building trade, and shall not employ any such persons to do work for them."

That this meeting of the Eastern Counties Federation recommends to its members a careful study of the proceedings of the Conference of Secretaries, of which a full Report appears in the Master Builders' Associations' *Journal* for November, 1906, and of which a Report will shortly be sent to each Association.

And this meeting further recommends that each Local Association should appoint a Special Organisation Committee to consider the said report, with a view to adopting any improved methods they may find therein described.

The Secretary was instructed to obtain from each Local Association its views on :

A. Clauses in Bankruptcy Act that operate unfairly so far as builders are concerned.

B. Printed circular from Home Office *re* dangers attendant on building operations.

The Secretary was also instructed to urge the members to use as far as possible the Form of Building Contract agreed to by the Royal Institute of British Architects, the Institute of Builders, and the National Federation.

Votes of thanks to the Chairman and to the Colchester M.B.A. closed the proceedings.

MISSION HALL, BELFAST.—The building formerly known as the Hotel Metropole, at 5 and 6, College-square North, Belfast, has been turned into a mission hall for the adult deaf and dumb. The alterations necessary were carried out under the personal superintendence of Mr. Henry Seaver, C.E. Mr. Jas. Kidd was the contractor for the building operations, the painting was done by Mr. Alex. Thompson, and Messrs. Musgrave & Co., Ltd., were responsible for the heating contract.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, S.W., Alderman Spicer, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend 3,403*l.* to Camberwell Borough Council for Beckett-street housing scheme; Mile End Old Town Guardians 522*l.* for poor law purposes; and Shoreditch Guardians 1,424*l.* for poor law purposes. Sanction was also given to Islington Borough Council to borrowing 1,000*l.* towards the cost of land for extension of Hampstead Heath.

Additional Secondary School and Training College Accommodation.—The following recommendations of the Education Committee were carried, after discussion :—

"That the estimates of expenditure on capital account, amounting to 37,500*l.*, submitted by the Finance Committee in respect of the acquisition of sites for secondary school and training college purposes in the districts of Clapham, Wandsworth, north-west of London, and Tooting be approved.

That it be referred to the Education Committee to take the necessary steps for the acquisition of sites, containing a total area of about 22 acres, in south-west and north-west London.

That it be referred to the Education Committee to report as to the steps necessary for the erection or the provision in the south-west and north-west of London of a training college and six secondary schools to accommodate 150 students, 1,350 boys, and 1,350 girls.

That it be referred to the Education Committee to take the necessary steps for the temporary utilisation of the vacant site in the possession of the Council at Craster-road (Brixton) for the purposes of higher education.

That it be referred to the Education Committee to report as to the steps necessary for the acquisition of the undermentioned sites—(i.) In the south-west of London for a new boys' school; (ii.) in the south-east of London for a new boys' school and a new girls' school; (iii.) in the north-west of London for a new girls' school.

That the resolution of March 20, 1906, so far as it relates to the temporary allocation for the purposes of higher education of the sites in the possession of the Council at Broomwood-road (Clapham) and Ancona-road (Woolwich), be rescinded.

That the sites in the possession of the Council at Broomwood-road (Clapham) and Ancona-road (Woolwich) be allocated for the purposes of higher education.

That it be referred to the Education Committee to report as to the steps necessary for the erection of a secondary school to accommodate 450 girls on the Council's site in Broomwood-road (Clapham).

That it be referred to the Education Committee to report as to the steps necessary for the erection of a secondary school to accommodate 450 boys on the Council's site in Ancona-road (Woolwich).

That, subject to the scheme for the administration of the Whitechapel Foundation School (Whitechapel) being amended to provide for the appointment by the Council of the representative on the governing body formerly appointed by the late authority, and subject to the plans for the extension of the premises being approved by the Council, the governors of the school be informed that the Council is prepared to make a special building grant of 1,000*l.*, provided that the governors contribute the remainder of the cost of the building, and that the work be taken in hand at once and completed to the satisfaction of the Council."

Street Improvement.—The Improvements Committee recommended, and it was agreed :—

"(*a*) That the estimate of expenditure on capital account of 15,700*l.*, submitted by the Finance Committee in respect of the widening of South Lambeth-road, be approved.

(*b*) That expenditure not exceeding 15,700*l.* be sanctioned in respect of the widening of South Lambeth-road as provided in resolution (*a*); and that the Improvements Committee be authorised to arrange for the said widening."

Proposed Rating of Empty Properties.—The Local Government, Records, and Museums Committee reported as follows :—

"The St. Marylebone Metropolitan Borough Council has forwarded a resolution expressing the opinion that it is advisable that Parliamentary powers should be obtained to half-rate empty houses, and asking the Council and the metropolitan borough councils to co-operate with it in obtaining an alteration of the law. The Bethnal-green and St. Pancras Metropolitan Borough Councils have intimated that they approve of the proposal.

The question of the exemption of empty properties from rates was considered by the Council on February 8, 1898, when it resolved to raise the question in the evidence to be given on behalf of the Council before the Royal Commission on Local Taxation of requiring owners of empty tenements to pay the whole or part of the ordinary rates. The Royal Commission reported as follows :—'We think it would be fair if some charge were made in respect of unoccupied properties, which undoubtedly receive some benefit from public expenditure, but at the same time there would be hardship if the full burden of rates were imposed in such cases. We think the equity of the case would be met by requiring the owners to pay a portion of the rates in respect of unoccupied tenements.'

As mentioned by the Royal Commission, empty houses receive benefit from public services, especially from those which are in the nature of the protection or improvement of property, such as police, lighting, highways, drainage, and fire protection, though in a less degree than occupied houses, and it is therefore equitable that their owners should contribute to the cost of the services. Empty houses also benefit by the general local services which, by adding to convenience and safety, make the locality a more desirable place for residence or business, and therefore facilitate letting. These benefits, however, do not affect building values, but go to enhance the value of the sites occupied.

There are several precedents for the application of the principle of rating empty houses. In the City of London, under the City Police Act, 1839, and the City of London Sewers Act, 1848, the owners of empty properties are charged with half of all rates except the poor rate. The rating of owners of empty properties is general in Scotland, where there are a large number of separate rates levied; for some the owner is liable, and for others the occupier, whilst most of the rates are divided between the owner and occupier. The owners are charged with their share of the rates whether their properties are occupied or not. Under local Acts passed before 1855 some of the local authorities in London had power to charge owners of empty properties with a portion of the rates, though not necessarily with all rates. These powers have not been exercised in recent years, and it is probable that they were superseded by the Metropolis Management Act, 1855, in which no provision was made for rating empty properties. Moreover, most of the local Acts were repealed by schemes under the London Government Act, 1899.

The only serious objection to the half-rating of empty houses appears to be that it might retard building and so increase overcrowding, but this difficulty might be partially obviated by providing that new premises should not be rated at all until they had been once occupied. When they became vacant after the first occupation the owners would be charged with a proportion of rates. The proposal would, on the other hand, tend to benefit occupiers generally, as landlords would not be able to afford to keep houses vacant awaiting high rents; a continuing charge would compel them to let the properties at their proper market values.

The total amount lost in the year 1903-4 by the metropolitan borough councils on account of empty properties was 421,000*l.*, equivalent to a rate of about 2¾d. in the pound. These figures afford some indication of the amount which would be produced by the partial rating of such properties; but it would appear that the number of empty houses has recently increased. Besides the saving of half the losses in rates, there would be a saving under the head of compounding, as a smaller abatement should be allowed on agreements with owners if the latter were chargeable with part of the rates. The loss from empties is borne by the individual parishes, and the rating of empties would therefore mitigate one of the causes of inequality of rates between parish and parish. The county rate would not be affected, as it is levied on the total assessable value in force for each metropolitan borough and parish. Whether one half of the rateable value is a reasonable proportion to adopt as the basis of rating vacant properties is a question which we have not considered.

The resolution of the St. Pancras Metropolitan Borough Council refers to vacant land as well as to empty houses. Vacant land is in a different position, as it does not benefit directly from the services previously referred to. The owner does, however, benefit indirectly by these services, as they add to the value of the land for building purposes. Part of the municipal rates is in the nature of a rent charge analogous to a ground rent paid to the owner of an estate in respect of improvements, such as highways, drainage, etc., and if a piece of land is in the improved area the fact that it is vacant is no reason why such rent charge should not be paid. The increasing value for building purposes of vacant land in towns is created by the growth of population and by the accompanying public services, and it would therefore be equitable that the owners of such land should contribute to the cost of the services. If land is withheld from the market it tends to raise the rents of surrounding properties by limiting the quantity of land available for building purposes, and owners should therefore be discouraged from taking that course by the imposition of a reasonable charge for rates. It appears to us, therefore, that the better basis of taxation would be the land or site value of each property, and that if this course were adopted it would remove altogether the risk of retarding building by charging rates on empty houses, as the value of the site would be the basis of charge, whether the site was covered by an empty house or not. We recommend—That the Bethnal-green, the St. Marylebone, and the St. Pancras Metropolitan Borough Councils be informed that, whilst the Council is to some extent in sympathy with the proposal with respect to the rating of empty houses, it is of opinion that the objects in view could be more satisfactorily attained by the rating of site values."

The recommendation was adopted, after discussion.

Motor-omnibus Dangers.—The Highways Committee recommended that, with a view to steps being taken to avoid, if possible, such accidents in future, the attention of the Local Government Board and of the Commissioner of Police of the metropolis be called to the three accidents to motor-omnibuses which have recently taken place on Waterloo Bridge within a short period of one another.

Sir J. Benn moved to add the following words :—"And that the Highways Committee do report upon the general effect of the use of motor-omnibuses upon the traffic of London." He said he thought it might be necessary in London to follow the example of Manchester, and refuse to licence any more of these vehicles.

Captain Hemphill accepted Sir J. Benn's

addendum on behalf of the Highways Committee.

Mr. R. A. Robinson then moved to add the further words, "and other forms of locomotion." He particularly wanted to bring in the heavy traction-engines.

Mr. Hardy stated that the latter question was already being considered by the Public Control Committee.

On a show of hands Mr. Robinson's proposed addendum was rejected.

Tramways and Street Widenings.—A joint committee of the Finance, Highways, and Improvements Committees recommended that the Improvements Committee, when submitting to the Council a proposal for a street improvement upon an existing or proposed tramway route, do report (1) whether the suggested improvement is desirable and urgently needed, apart from any question of the construction or reconstruction of tramways along the thoroughfare; or (2) whether the suggested improvement, though desirable, could be postponed for a few years, except for the reason that it is required for the purposes of a tramway; or (3) whether the suggested improvement is not required except for the purposes of a tramway; that in each case falling under class (1) no charge be made against the tramways account; that in each case falling under class (2) a contribution of a fixed sum, being one-eighth of the estimated net cost of the improvement, be charged to the tramways account; that in each case falling under class (3) the whole of the cost of the improvement be charged to the tramways account; and that the recommendations of the committee do provide for such charges against the tramways account.

Captain Swinton moved that the recommendation be referred back to the Committees. He pointed out that when the Council's witnesses were before the Traffic Commission they emphatically declared that it was the practice to insist upon the charge for street widenings being apportioned as to one-third to the tramways account, one-third to the local rate, and the other third to the Council rate. The Council's figures showed that this had never been done, and in one particular case the amount charged to the tramways was only one-fortieth of the cost.

Mr. Whitaker Thompson, in seconding the amendment, said the recommendation of the joint committees was the throwing to the winds absolutely a policy which was well understood by the people of London, and it was constructing out of nothing a policy which never could be understood by the people of London.

Lord Welby stated that the one-third charges had been fixed before the Council had gained sufficient experience, and it had now been shown that that system acted harshly and unfairly, hence the proposed new conditions.

Mr. McKinnon Wood contended that the tramways must have been worked at a profit, or the Council would not have been able to put aside £480,000 as a sinking fund.

After further discussion the amendment was rejected on a division by seventy-two votes to thirty-two. The recommendation of the Committee was then adopted.

Plant for Sub-stations.—The Highways Committee recommended :—

"(*a*) That the estimate of expenditure on capital account of 9,500*l*., submitted by the Finance Committee, be approved in respect of the installation of additional motor-generators and switch-gear, including cable connexions, etc., at the Battersea, Brixton, Clapham, Streatham, and Wandsworth tramways sub-stations.

(*b*) That expenditure on capital account not exceeding 9,500*l*. be sanctioned for the provision of the motor-generators, switch-gear, etc., referred to in the foregoing resolution (*a*).

(*c*) That the contract entered into with the General Electric Company, Ltd., in pursuance of the resolution of July 25, 1905, be extended so as to include the supply, delivery, and erection, at a cost not exceeding 500*l*., of the additional switch-gear required for the Battersea tramways sub-station . . ."

Tramways.—The Highways Committee recommended :—

"That the Highways Committee be authorised to communicate with the Board of Trade and the Camberwell and Lewisham Metropolitan Borough Councils with a view to the adoption of the overhead trolley, instead of the underground conduit, system of electric traction upon the authorised tramways (i.) from Woodwarde-road, *viâ* Lordship-lane and London-road, to Dartmouth-road, Forest-hill, and (ii.) from Grove-vale, *viâ* Goose-green, East Dulwich-road, and Peckham-rye, to Stuart-road, Peckham."

Pimlico Generating Station Site: Acquisition of Property.—They also recommended :—

"That the claim of the Duke of Westminster in respect of the freehold of the property known as Nos. 1 to 7, Pulford-street, 1 to 5, Pulford-terrace, 80, 81, and 140, Grosvenor-road, and land and gas-works at Pimlico, be settled for a sum of 22,500*l*., with 250 guineas towards the surveyors' fees, together with a solicitor's preliminary fee, and the costs allowed under the Lands Clauses Consolidation Acts; that the notice-to-treat served by the Council in respect of Nos. 8 to 35, Pulford-street, be withdrawn; that the solicitor do complete the matter; and that the seal of the Council be affixed to any necessary documents in connexion therewith."

Improvement.—The Improvements Committee recommended :—

"(*a*) That the estimate of expenditure on capital account of 14,400*l*. submitted by the Finance Committee in respect of the widening of Old-street at Nos. 339 to 345 shown on the plan be approved.

(*b*) That expenditure not exceeding 14,400*l*. be sanctioned in respect of the widening of Old-street as provided in resolution (*a*); and that, subject to the Shoreditch Metropolitan Borough Council agreeing to contribute one-third of the net cost, the Improvements Committee be authorised to arrange for the said widening."

Advertisement Sign in Front of the Palace Theatre, Cambridge-circus.—The Building Act Committee recommended that the solicitor do take all necessary steps to uphold in the High Court the magistrate's decision in the case of the Council *v.* The Palace Theatre, Ltd., with regard to the sign in front of the Palace Theatre, Cambridge-circus, Charing Cross-road.

Erection of a Show-case in Front of No. 8, Grafton-street.—The same Committee also recommended that the solicitor do take all the necessary steps to obtain the opinion of the High Court in the matter of the decision of the magistrate at the Marlborough-street police-court with regard to the retention of a wood and glass show-case in front of No. 8, Grafton-street, St. George, Hanover-square.

Both recommendations were agreed to.

Kensington Fire-station: Acquisition of Site.—The Fire Brigade Committee recommended that excess expenditure on capital account of 2,727*l*. 2s. 6d. over the estimate of 14,000*l*. approved on November 26, 1901, in respect of the acquisition of the site of the new Kensington fire-station, and of property at Deptford required for fire brigade purposes, be sanctioned.

Installation of Additional Plant, etc., Elephant and Castle Sub-station.—The Highways Committee recommended :—

"That the supplemental estimate on capital account of 3,500*l*. submitted by the Finance Committee be approved in addition to the estimate of 7,500*l*. approved on July 31, 1906, in respect of the erection and equipment of additional plant at the Elephant-and-Castle tramways sub-station, including incidental works, etc."

Working-class Accommodation Demolished and Built During the Year 1905.—The Housing of the Working Classes Committee brought up the following report :—

"We submit as a separate document a return which has been prepared showing the net addition to working-class accommodation provided in the county of London and in the adjacent districts during the year 1905. The return also shows the number of rooms and tenements contained in the houses, as well as the average weekly rents charged per tenement and per room.

The information relating to the county areas has been obtained in the first place from the provisional valuation lists of each parish, and subsequently checked by local investigation. As regards the extra-London districts, the town clerks of the boroughs and the clerks of the councils of the various urban and rural districts have either supplied statistics or given every facility for obtaining the necessary information.

The several parishes and metropolitan boroughs in London and the boroughs, parishes, and urban districts outside have for the purposes of the return been grouped into five sections, but the figures are given separately for each unit. The sections are—

(i.) Western section—From the river northwards to the Edgware-road, and the adjacent districts in Middlesex. This district includes the City of Westminster.

(ii.) Northern section—From the Edgware-road to the Kingsland-road, and the adjacent districts in Middlesex. This district includes the City of London.

(iii.) Eastern section—From the Kingsland-road southwards to the river, and all the adjacent parishes in Essex.

(iv.) South-eastern section—From the river to the eastern boundary of the Metropolitan Borough of Lambeth, and the adjacent parishes in Kent; and

(v.) South-western section—From the eastern boundary of the Metropolitan Borough of Lambeth westward to the river, and the adjacent parishes in Surrey.

Each section is sub-divided into three zones, which are shown on a map which accompanies the return. The central zone or area comprises the City of London, the City of Westminster, the Metropolitan Boroughs of Holborn, Finsbury, Bethnal-green, St. Marylebone, Stepney, Bermondsey, and Southwark, and the northern part of Lambeth and the southern part of St. Pancras. The next zone comprises the remainder of the county of London; while extra-London comprises the boroughs, urban districts, and parishes in the immediate neighbourhood of the county of London. We are of opinion that the scope of the return should be extended so as to include Ilford and other similar suburbs, and we have given instructions for this to be done in future years.

Taking the three zones together, the number of rooms provided and demolished in the course of the year may be summarised as follows :—

—	Central area.	Rest of London.	Extra-London.	Total area.
Number of rooms provided	5,072	21,004	36,874	62 950
Number of rooms demolished	8,708	3,060	245	12,013
Net addition.....	—3,636	17,944	36,629	50,937

The net addition to the number of rooms in the whole area was 53,499, 59,009, and 51,566 in the years 1902, 1903, and 1904 respectively. In the county of London the net addition was considerably less than in previous years, owing to the unusually large number of houses demolished, the greater part of the new accommodation to replace this loss, so far as it has resulted from the exercise of statutory powers, having already been provided in previous years. It is worthy of note that of the 36,874 rooms added in the extra-London area, no fewer than 15,006 are situated in the eastern section, comprising East Ham, Leyton, Walthamstow, Wanstead, and West Ham.

The extent to which the new accommodation for the working classes has sufficed to meet the increase in the working-class population is a matter which cannot be ascertained with any great degree of accuracy. Upon consideration of the number of persons occupying the Council's dwellings it is found that an average of one and a half persons per room is a reasonable figure to take for accommodation provided within the county area, and an average of one and a quarter persons per room may be taken as a general basis in the extra-London area. If this basis be adopted, it may be stated that in the whole area accommodation for 67,248 persons has been added in the course of the year, as compared with 71,317, 79,130, and 69,212 in 1902, 1903, and 1904 respectively. If the population increased in the same ratio as in the decennium 1891-1901, the increase would be 100,852 persons of all classes, although it is believed that an estimate on this basis shows a larger increase than has actually taken place. On the assumption that the increase in the working-class population amounted to two-thirds of the total, such increase would be 67,235 persons on the basis of the decennial period for the whole area, or 60,109 persons on the basis of the last quinquennial period for London and the decennial period, for extra-London, whereas accommodation for 67,248 persons has been provided.

With few exceptions, there has been very little variation in the rents from year to year, but the figures in the return give some indication of a tendency in the rents in the central area to decrease and in the rest of London and the extra-London districts to increase.

We have given instructions for a copy of the return to be supplied to each member of the Council, and we recommend that the return submitted by the Housing of the Working Classes Committee of the working-class accommodation provided and demolished in the county of London and the adjacent districts during the year 1905 be placed on sale, and that a copy of such return be sent to each of the local authorities who have given information on the subject."

Webber-row, etc., Scheme, Southwark.—The same Committee also reported as follows :—

"Overy and Delarch-buildings, two of the five blocks of dwellings which are being erected on the Webber-row area, Southwark, are almost completed, and will be open for inspection by members and their friends on Monday and Tuesday, November 19 and 20. Each of these blocks contains accommodation for 230 persons in twenty tenements of two rooms and twenty-five tenements of three rooms, and upon the completion of the remaining three blocks accommodation will have been provided for 1,130 persons. The dwellings have been erected under the provisions of the Webber-row and Wellington-place and King's Bench-walk scheme, which is being carried into effect under Part I. of the Housing of the Working Classes Act, 1890. The clearance of the areas comprised in the scheme will involve a total displacement of 997 persons of the working class."

Piccadilly, near the Circus.—The Improvements Committee reported as follows :—

"We have considered an offer by the Commissioners of H.M. Works, etc., to arrange for the railing in front of the Geological Museum in Piccadilly to be set back, subject to the Commissioners being put to no expense in respect of paving works, and subject to the payment of certain fees. The congestion of pedestrian traffic at this point will be much relieved, for by means of the improvement the width of the footway, which at present

varies from 6 ft. to 7 ft., will be increased for a distance of 70 ft. to a width of about 9 ft. The Westminster City Council has agreed to bear the necessary expenses connected with the improvement. We desire to express our appreciation of the Commissioners' action in enabling this desirable widening of Piccadilly to be effected on such reasonable terms."

Lewisham High-road to High-road, Lee.—The Improvements Committee also recommended :—

"(*a*) That resolution (*b*) of July 31, 1906, with regard to the reference to the Works Committee of paving, etc., works in High-road, Lee, be rescinded.

(*b*) That the working drawings, specification, bills of quantities, and estimate of the cost (24,517*l.*) of the construction of the tramway tracks of the authorised tramways from High-street, Lewisham, to Lee-green be approved and be referred to the Works Committee with a view to the works being executed by them without the intervention of a contractor.

(*c*) That, subject to the Lewisham Metropolitan Borough Council agreeing to take over any contracts for kerbs, setts, etc., entered into in respect of the paving, etc., works in High-road, Lee, the offer of the borough council to undertake at a fixed cost of 5,329*l.* 6*s.* 9*d.*, in addition to the actual cost, as certified by the Council's officers, of pipe diversions and the connexion or extension of house drains, certain paving and other works in the thoroughfare in connexion with the Lewisham High-road to High-road, Lee, improvement, authorised by the London County Council (Tramways and Improvements) Act, 1904, be accepted. . . .

(*d*) That the execution by the Works Committee, as a jobbing work, of the sewer connexions and extensions of side entrances affecting the Council's sewer in High-road, Lee, be approved."

Protection of Public Buildings.—Sir W. J. Collins asked the chairman of the Fire Erigade Committee what had been the practice of the Committee with regard to the inspection of buildings of a public character, such as hospitals, etc., with a view to advising those responsible as to what course should be adopted to prevent fire. There was a great deal of uncertainty in the public mind as to what the Committee were doing at the present time.

Mr. Shrubsole said he would see that an answer was given next week.

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Hammersmith.—A waiting-room at No. 69, Brook-green, Hammersmith, to abut upon Caithness-road (Mr. J. McManus for Dr. Denne).—Consent.

Islington, North.—An addition in front of the Convent school of Notre-Dame, No. 55, Tollington-park, Islington (Mr. J. H. Goodchild for the trustees of the school).—Consent.

Lewisham.—Houses with bay-windows and pent roofs on the southern side of Woolstone-road, Lewisham, to abut also upon the eastern side of Broxted-road (Messrs. Norfolk & Prior for Mr. G. H. Walker).—Consent.

Marylebone, East.—That the application of Messrs. Hudson & Hunt for an extension of the period within which the erection of porches and balconies to six blocks of residential flats in Glentworth-street, St. Marylebone, was required to be completed, be granted.—Consent.

St. George, Hanover-square.—A projecting iron and glass skylight over a portion of the area of No. 28, Grosvenor-street, St. George, Hanover-square, abutting upon Davies-street (Mr. C. W. Stephens for Lord Edward Churchill).—Consent.

St. George, Hanover-square.—An additional story to a bay-window in front of No. 39, Berkeley-square, St. George, Hanover-square (Messrs. Bertram & Son for Mr. A. Paget).—Consent.

Strand.—A deviation from the plans approved on May 28 for the erection of two iron and glass shelters in front of the Waldorf Theatre, Aldwych and Catherine-street, so far as relates to an alteration in the method of fixing the two central cantilevers of the shelter at the main entrance to the theatre (Messrs. Waring & Gillow, Ltd.).—Consent.

Wandsworth.—One-story shops in front of Nos. 289 to 303 (odd numbers only) inclusive, Streatham High-road, Streatham (Mr. A. E. Chasemore for Mr. G. W. Elvin).—Consent.

Wandsworth.—Six houses on the northern side of Church-lane, Tooting, between Moring-road and Lucien-road (Messrs. Nash & Lillywhite). Consent.

Wandsworth.—The retention of bay-windows and porches to six houses on the northern side of Streatham-common North, Wandsworth, between Valley-road and Deerhurst-road (Mr. W. Newton Dunn). —Consent.

Wandsworth.—Porches to ten houses on the southern side of Hazlewell-road, Putney, between Larpent-avenue and Luttrell-avenue (Mr. J. C. Radford for Mr. E. R. Parry).—Consent.

Wandsworth.—A building at St. Anne's Hoe, Streatham-hill, Wandsworth (Mr. W. Begley for the Guardians of St. Pancras).—Consent.

Woolwich.—A motor-house at the rear of No. 240, Burrage-road, Plumstead, to abut upon Cambridge-place (Mr. J. O. Cook for Dr. F. H. Preston).—Consent.

Hackney, Central.—The bringing forward of a one-story addition in front of No. 422, Mare-street, Hackney (Messrs. Davis & Emanuel for Mr. H. W. Hickman).—Refused.

Lewisham.—Additions and raised basements at Nos. 1 and 2, Albert-villas, Station-approach, Catford-bridge (Mr. A. W. Osborn for Mr. D. Murray).—Refused.

Marylebone, East.—An iron and glass shelter in front of a building on the northern side of Wigmore-street, St. Marylebone, abutting also upon Welbeck-street (Messrs. Wallace & Gibson for Messrs. Debenhams, Ltd.).—Refused.

Marylebone, East.—A projecting porch in front of No. 23, Upper Wimpole-street, St. Marylebone (Mr. S. W. Neighbour for Mr. C. Gibbs).—Refused.

Norwood.—Two houses on the north-western side of Herne-hill, Norwood, to abut also upon Poplar-walk (Mr. F. J. Handforth).—Refused.

Width of Ways.

Camberwell, North.—Consent, in connexion with the erection of a building at the rear of No. 111, Camberwell-road, Camberwell, to the retention of a boundary fence wall at less than the prescribed distance from the centre of the roadway of Goodyear-place (Mr. A. E. Symes for the Addington Timber, Slate and Cement Company, Ltd.).—Consent.

Kensington, North.—Additions at St. John's school, Heathfield-street, Notting-hill, at less than the prescribed distance from the centre of the roadway of Heathfield-street (Messrs. Beazley & Burrows for the managers of the school).—Consent.

Kensington, South.—Retention of a one-story building on the southern side of Seymour-place, Fulham-road, Kensington, between Nos. 9 and 11, and at less than the prescribed distance from the centre of the roadway of the street (Mr. M. King).—Consent.

Kensington, South.—Retention of manure pits on the eastern side of Logan-mews, Logan-place, Kensington, at less than the prescribed distance from the centre of the roadway of Logan-mews (Messrs. Chesterton & Sons for Mr. A. H. Farrow).—Consent.

Southwark, West.—Buildings on the northern side of Webber-street, Southwark, to abut also upon the eastern side of Valentine-place (Mr. W. Egerton for the Maltina Company).—Consent.

Strand.—A one-story addition at the rear of "The Windsor" public-house, No. 427, Strand, at less than the prescribed distance from the centre of Harvey's-buildings (Mr. H. G. Leslie).—Consent.

Woolwich.—A workshop building at the rear of No. 69, Pattison-road, Woolwich, at less than the prescribed distance from the centre of a passage-way leading from Pattison-road to Hudson-road (Mr. H. Greenberg).—Refused.

Formation of Streets.

Hackney, South.—That an order be issued to Messrs. Reynolds & Eason, refusing to sanction the formation or laying out of a new street for carriage traffic on a site on the eastern side of Temple-mills-road, Hackney-wick (Messrs. A. E. & O. Bradshaw).—Refused.

Space at Rear.

Paddington, South.—Buildings upon the site of No. 112, Westbourne-grove, Paddington, with an irregular open space at the rear (Mr. G. A. Sexton for Messrs. T. Elliott & Sons).—Consent.

Whitechapel.—Buildings upon a site on the eastern side of Lolesworth-street, Whitechapel, to abut also upon Wentworth-street and Thrawl-street, with an irregular open space at the rear (Messrs. Dolley & Altman).—Consent.

Space at Rear and Alteration of Building.

St. George, Hanover-square.—An addition over a portion of the space at the rear of No. 39, Curzon-street, Mayfair (Mrs. B. Skeffington-Smyth).—Consent.

Space at Rear, Projections and Alteration of Building.

St. George, Hanover-square.—An addition to "Berkeley House," on the southern side of Hay-hill, St. George, Hanover-square, to abut also upon Berkeley-street (Mr. W. Wonnacott for Mr. A. H. Young).—Consent.

Alteration of Building.

Hampstead.—The separation with glazed wooden screens of a proposed lock-up shop to be erected in the booking-hall of the Finchley-road station (Metropolitan Railway) (Mr. E. Owers).—Refused.

Architectural Societies.

BRISTOL SOCIETY OF ARCHITECTS.—The Society opened the new session on Monday evening, the 12th inst., at the Fine Arts Academy, Queen's-road, Bristol, the President, Mr. H. Dare Bryan, being in the chair, when a paper was read on "Public Buildings," by Mr. H. W. Wills, of London. The lecturer started with the planning of Egyptian buildings, and those of the Romans and the Greeks, and pointed out how the fine principles of planning embodied in these buildings could be adapted by the skilful planner to modern requirements. The paper was illustrated by numerous lantern slides, and was concluded by several illustrations of modern public buildings. A vote of thanks to the lecturer was proposed by Mr. M. A. Green, seconded by Mr. R. C. James, and carried by acclamation. The Society meets as usual on the second Monday in each month at the Fine Arts Academy, and at each meeting papers of interest to the members are to be read. It is hoped that it will be possible to throw some of these meetings open to the public, who would be admitted by invitation cards on those occasions when the subjects of the papers were of general interest.

MANCHESTER SOCIETY OF ARCHITECTS.—The second general meeting of the students of this Society was held on the 13th inst., when Mr. G. Hartley Goldsmith gave a paper on "The Influence of Materials on Architecture," and illustrated it by means of numerous lantern slides. The lecturer began by pointing out the origin of the Egyptian style, from the primitive use of reed and mud construction. Turning to the Greek Doric style, he showed the wooden origin of the entablature and also of the Ionic and Corinthian styles.* The Roman style he described as breaking away from treabeated Greek work, and developing a new style by means of arch construction combined with the use of concrete. This was carried to a further end in Byzantine times by means of the pendentive dome. He gave reasons for the origin of the stone vault which appeared in South France in the Romanesque period, and gave a very full account showing how the use of small stones laid in mortar was directly responsible for the development of the Gothic style. Renaissance work he criticised severely, as it was not true to the material it used, whilst he considered modern architecture to be in a transition stage, architects not realising as yet the full possibilities of steel construction. Professor Capper occupied the chair, and afterwards offered some excellent suggestions on points on which the lecturer was rather uncertain, quoting Pausanias, to show that the Greek Doric column was probably derived from a wooden origin.† A very interesting and lively discussion followed.

Engineering Societies.

JUNIOR INSTITUTION OF ENGINEERS.—Under arrangements, kindly made by Mr. A. L. C. Fell, M.I.E.E., Chief Officer of the London County Council Tramways, a visit to the Council's electricity generating-station at Greenwich was paid by this Institution on November 17, and was numerously attended. The Superintendent, Mr. E. W. Dickinson, and members of the staff showed the members round in parties, the features of interest being :—Pier, to land about 1,000 tons of coal per day, can accommodate heavy steam colliers; electric coal-handling machinery; mechanical conveyors, capacity of bunkers 13,500 tons; mechanical stokers; twenty-four five-drum Stirling boilers, 200 lb. pressure; superheaters; economisers; engines of reciprocating type; four steam generating sets, 3,500 kw. capacity each. Only half of station built at present. Proposed to use turbo-generators of total capacity 20,000 kw. for second half. Existing generators are of revolving field type, delivering three-phase currents at 6,600 volts between phases, 25 cycles per second, and star-wound stators

* Is Mr. Goldsmith quite sure of that?—ED.

† Pausanias only mentions that he had seen a wooden column, but that only proves that in a certain case wooden columns were used—possibly for economy. The whole character of the earliest known Doric columns is against the idea of a wooden origin.—ED.

with centre point earthed. Laminated steel stamped magnets. Switchgear of oil-break, remote control, electrically operated. Provision for eight generators and thirty-two feeders. Substation contains three motor-generators of 500 kw. capacity to suply direct current at 550 volts. Battery of 280 Tudor cells. Condensing water from the river by four 30-in. cast-iron pipes. Electric crane in yard. Estimated cost of complete station 900,000*l*.

Fifty Years Ago.

FROM THE *Builder* OF NOVEMBER 22, 1856.

LONDON DEATH-RATES.

IN illustration of a lecture given by Mr. John Leslie at the Polytechnic on Monday last, a notice of which will be found on another page, the lecturer introduced a very remarkable map of London, thrown on the disc from a MS. map prepared by the Registrar-General, showing the average annual mortality of the various districts during ten years (1841 to 50, inclusive), and marking in black colour those parts, mostly bordering the river, where the rate of mortality is highest. Let us say in a parenthesis that this illustration alone will justify a visit to the Polytechnic on Tuesday next, when the lecture is to be repeated. And what did this death-map show? Why, that while in Putney and in the Hanover-square district, the average number of deaths annually in every thousand of the population was 16, and in Dulwich and Sydenham 14 only; in Bermondsey it was 28; in part of Chelsea, 31; in Shoreditch, 33; and in part of Greenwich no less than 47! What more striking evidence could be adduced that there are accidental and local causes in operation tending to shorten life, which causes, as Christian men, as political economists, and as egotists simply striving to save ourselves, it is our paramount and most pressing duty to strive to remove.

Illustrations.

STATUE AT KING EDWARD VII. SCHOOL, KING'S LYNN.

WE illustrated last week the new schools at King's Lynn, which were recently opened by the King in person.

The pedestal with the statue of King Edward VII., illustrated this week, stands in front of the principal façade of the building. Mr. W. R. Colton, A.R.A., is the sculptor.

NATIONAL PROVINCIAL BANK OF ENGLAND, LTD. (WORCESTER BRANCH).

THESE new premises are being erected on the site of the Golden Cross, Worcester. The former building, which had to be demolished, contained certain features interesting to antiquarians, such as an old crypt which is presumed to have been connected with the City Cathedral, in the days before the Reformation, by an underground passage.

The ground floor and basement of the front portion of the new building are occupied by the bank, and the remainder of the building is tenanted by the Inland Revenue authorities.

The front is of Portland stone, and this stone is also used on the sides, together with pressed brick. The interior woodwork about the bank is teak. An asphalt flat over the first floor takes the place of a roof.

The general contractors for the building are Messrs. Bromage & Evans, of Worcester. The heating, lighting, and ventilating will be carried out by Messrs. Pemberton, Arber, & Co., of Gray's Inn Passage, Holborn; and the architects are Messrs. Chas. Heathcote & Sons, of London and Manchester.

HAMBLETON CHURCH, RUTLAND.

THE portion of the church shown in the view, exhibited in this year's Academy, consists of one bay of the nave with 12th century arcade and 15th century clearstory, the proposed nave and aisle roofs, the screen to the chapel, with figure of S. Andrew—all in oak. A new chancel arch with metal screen, pulpit, rood, lectern, faldstool, and organ in oak. The organ pipes are gilded with the ornament burnished.

The reredos is a triptych gilded and burnished, with a panel subject of the Crucifixion; the Ascension is illustrated in the East window above the reredos.

The chancel, with a new oak roof and a complete scheme of stained glass for the windows, was completed in 1891.

Mr. John T. Lee is the architect.

SKETCHES IN SPAIN.

THESE illustrations are reduced from some of the water-colours by Mr. H. C. Brewer which, as mentioned in a note on page 592, are at present exhibited at the Gallery of the Fine Art Society.

COURT OF COMMON COUNCIL.

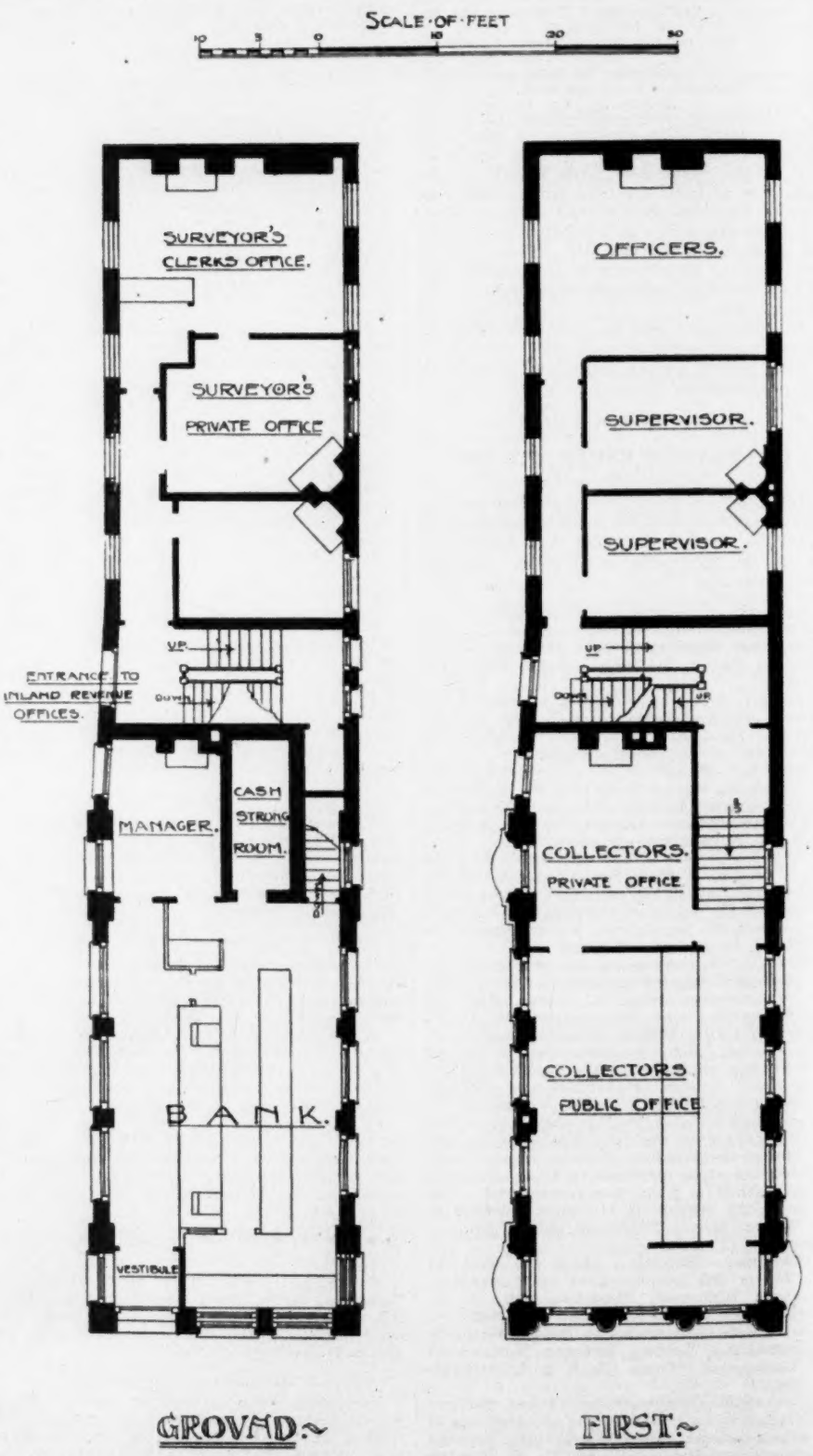
A MEETING of the Corporation was held at the Guildhall on Thursday last week, the Lord Mayor, Sir William Treloar, presiding.

Widening of Cloth Fair.—The Improvements and Finance Committee submitted an arrangement, which was adopted, for acquiring the freehold interest in so much of the upper floors of No. 60, West Smithfield, as project over Cloth Fair and the party wall on the southern side supporting the same, for the sum of 2,000*l*.

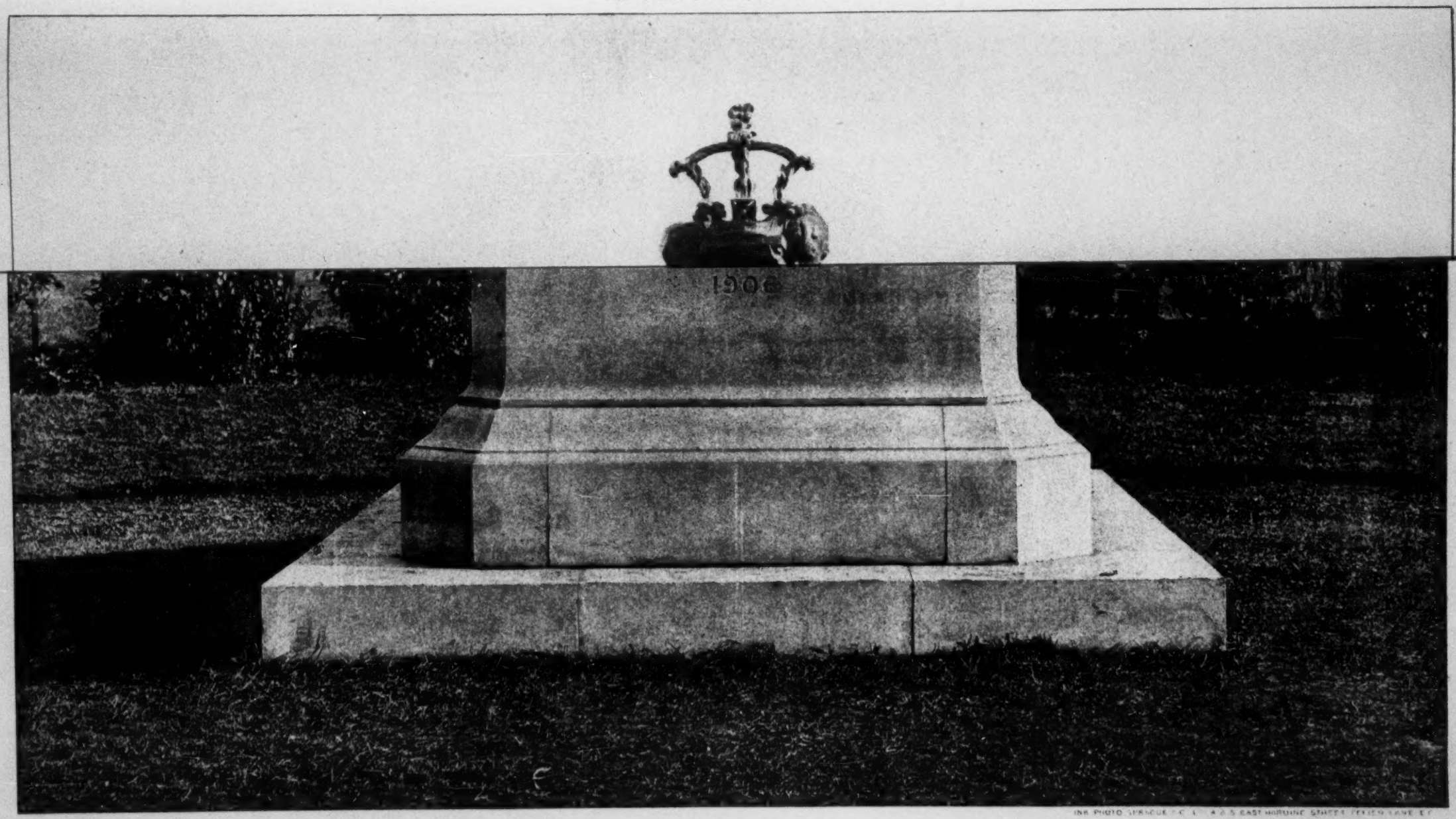
Repairs, etc.—It was agreed, on the recommendation of the same committee, to accept the tender of Messrs. Story & Triggs for re-upholstering the seating, etc., in the committee-room; and also to carry out certain internal cleansing and painting works, etc., needed at the Artizans' Dwellings in Stoney-lane, Houndsditch.

LECTURE HALL, BASINGSTOKE.—A new lecture hall is being erected in connexion with the London-street Congregational Church, Basingstoke. Messrs. Wallis & Smith, architects, prepared the plans for the work.

SALE OF LAND AT FOREST GATE.—Messrs. Boyton, Sons, & Trevor, sold recently, by private treaty, freehold ground rents amounting to 50*l*. per annum, secured upon a weekly property in Forest-street, Forest Gate. The price realised was, approximately, twenty-three years' purchase.



National Provincial Bank, Worcester. Plans.



STATUE IN FRONT OF KING EDWARD VII. SCHOOL, KING'S LYNN.—Mr. W. R. Colton, A.R.A., Sculptor.

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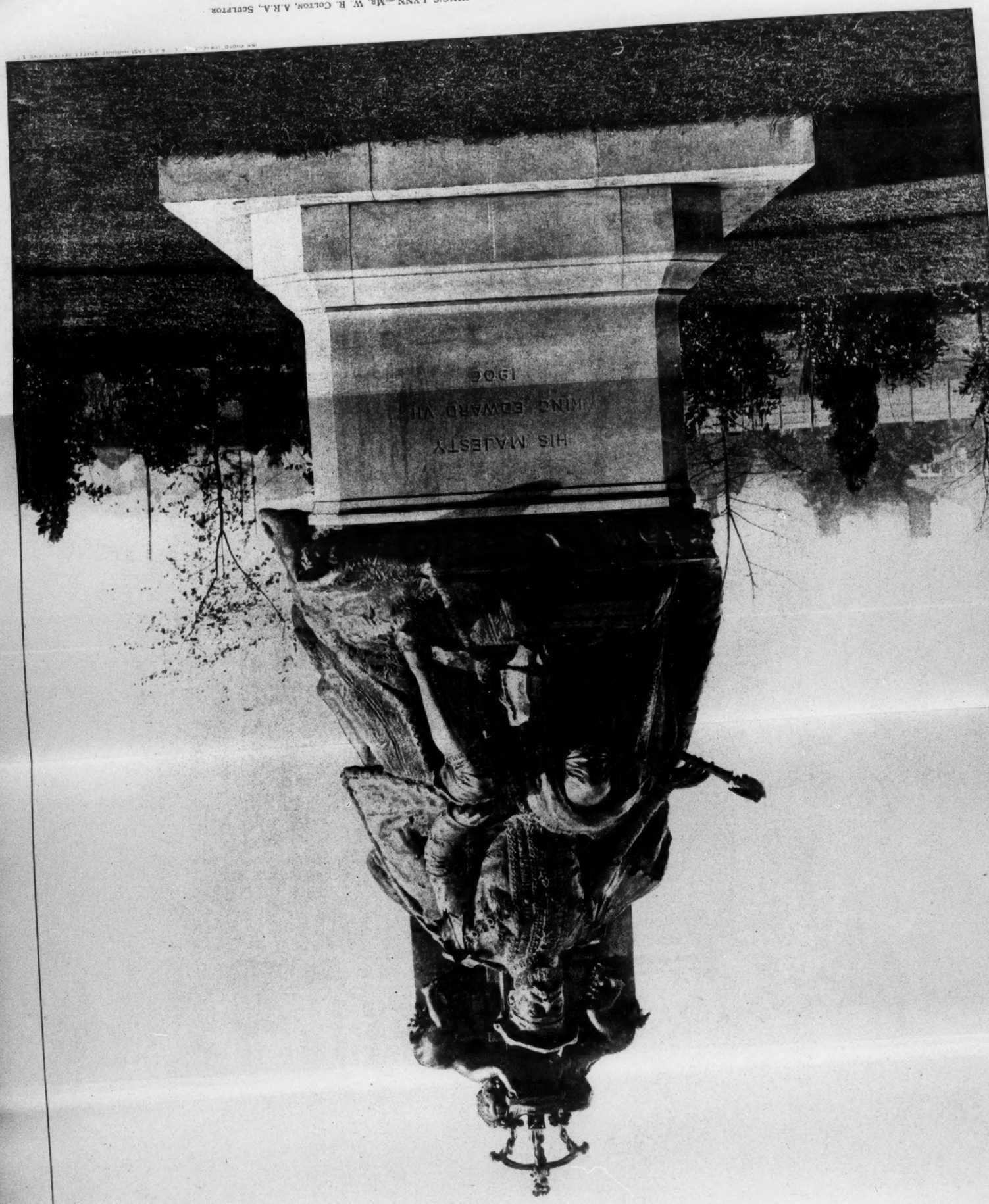
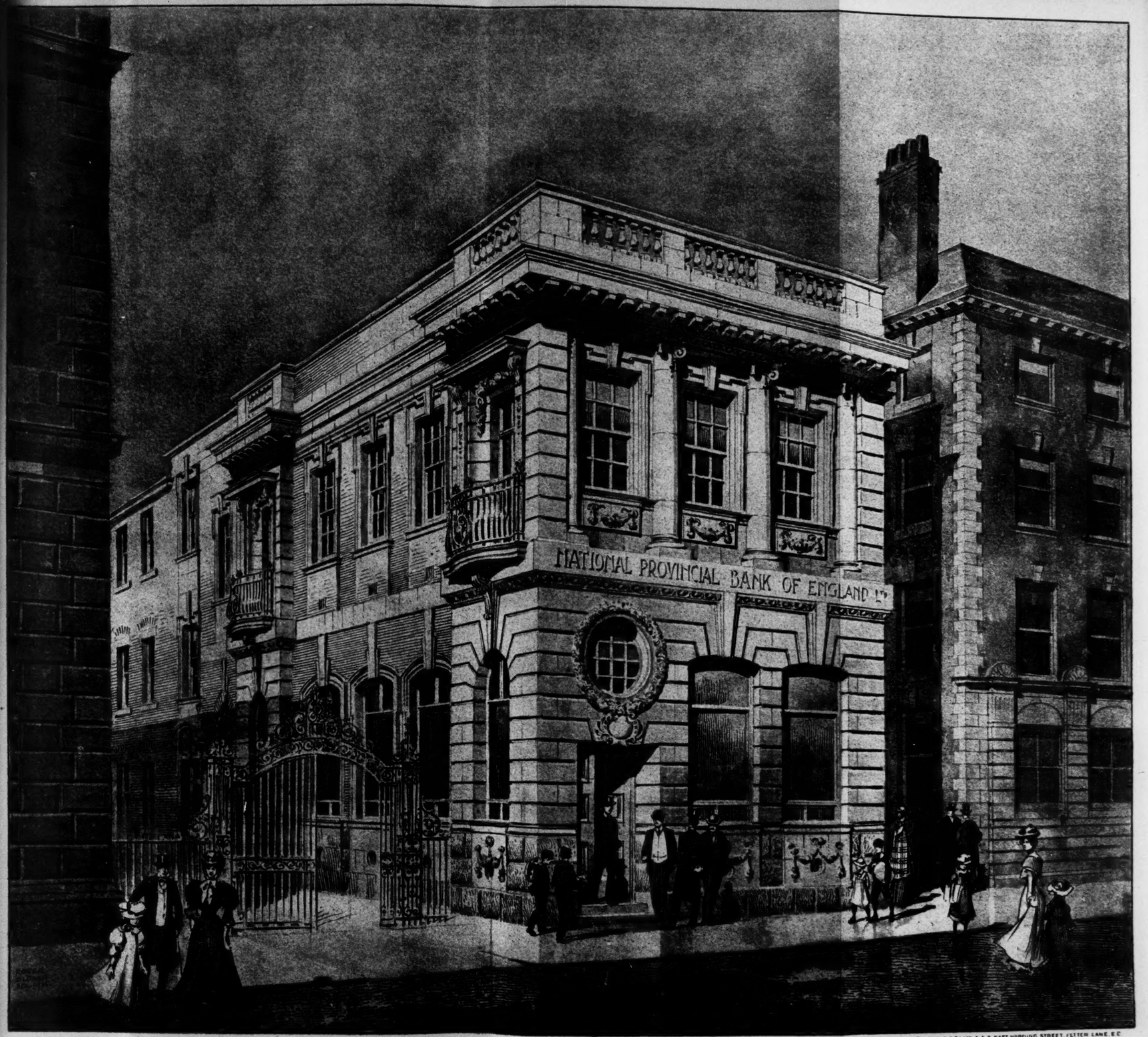


Provincial Hall, Worcester. Plans.



THE NATIONAL PROVINCIAL BANK OF ENGLAND, WORCESTER.—Messrs. Chas. Heathcote & Sons, Architects.

INK PHOTO SYRACUSE A.C.L.U. 443 EAST HARDING STREET FETTER LANE E.C.

LAMBETH (DVTCH
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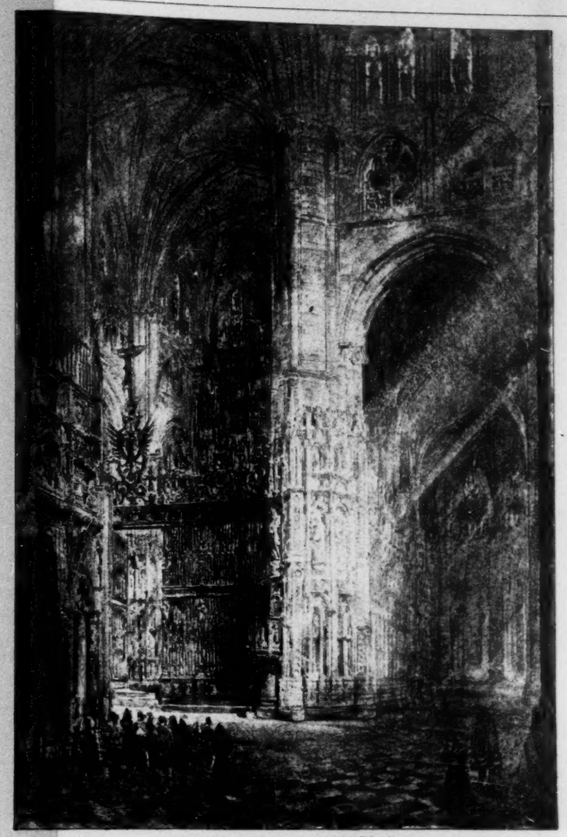
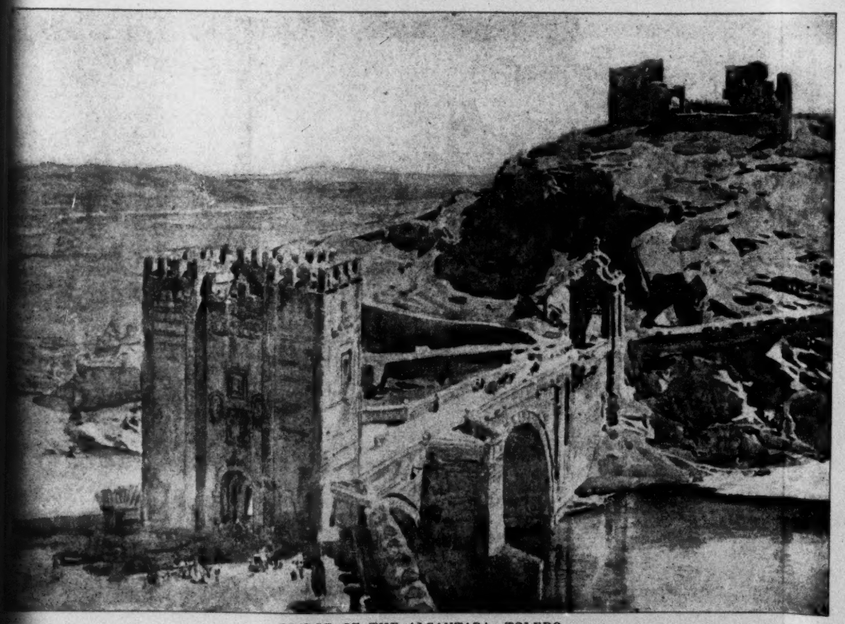
JOHN·O·LEE MAY
September 1905 IRCHITECT

CHURCH OF CHRISTO DE LA LUZ, TOLEDO (AN ANCIENT MOSQUE).

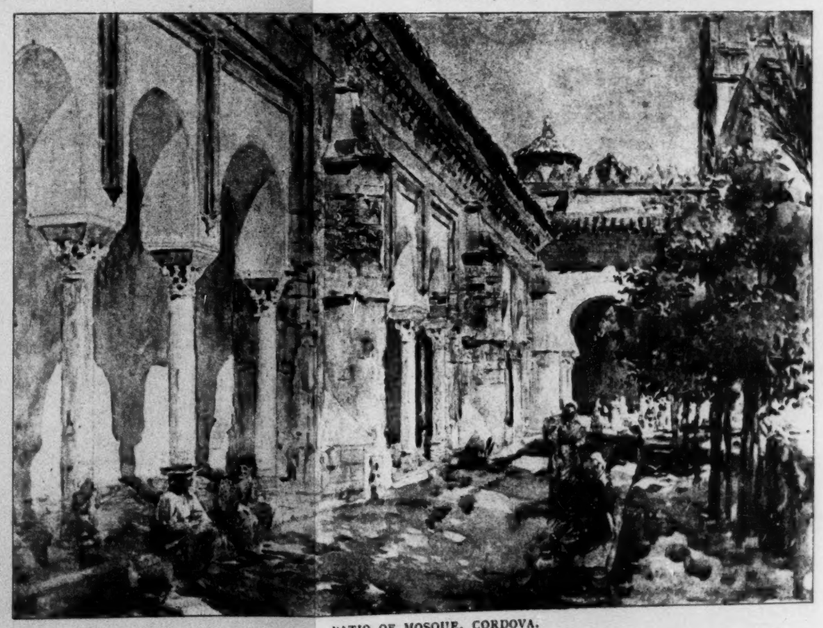
BURGOS CATHEDRAL.



INTERIOR, TOLEDO CATHEDRAL.



BRIDGE OF THE ALCANTARA, TOLEDO.



PATIO OF MOSQUE, CORDOVA.

INK PHOTO SPRAGUE & C° L^TD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

SKETCHES IN SPAIN.—By Mr. H. C. Brewer.

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Competition.

BARNSLEY HIGH SCHOOL FOR GIRLS.—The extended time for sending in drawings expires on November 30. The assessor is Mr. E. R. Robson, of Westminster.

Books.

Attrition Tests of Road-making Stones. By E. J. LOVEGROVE, M.Inst.C.E. With Petrological Descriptions by JOHN S. FLETT, M.A., D.Sc., F.R.S.E., and J. ALLEN HOWE, B.Sc. (London: The St. Bride's Press.)

RECOGNISING the dearth of reliable information concerning the relative value of different kinds of stone for road-making purposes, Mr. Lovegrove, the Borough Engineer of Hornsey, has made a series of tests upon a large number of rocks of various classes, and the results, together with specimens of the material before and after treatment were submitted for examination and report to the Geological Survey.

The book now published contains a table giving results of the tests conducted at Hornsey upon numerous varieties of eight classes of rock derived from sources in different parts of the United Kingdom, and including some from France and Germany, and, in addition, upon samples of blast-furnace slag and artificial stones. The table of attrition tests prepared by Mr. Lovegrove states the description of stone, the quarry or locality whence it was derived, whether broken by hand or machine, the percentages of chips and dust detached during wet and dry tests, and the specific gravity of the material. The test number is also given and reference to the page where a petrological description of the stone will be found.

The author says that "in comparing the hand *v.* machine-broken stone, out of ten tests referred to in the list eight are in favour of the hand-broken method." This sentence is a little vague. Examination of the table leads to the inference that it refers to some isolated cases where samples of the same stone, broken by hand and machine respectively, were made the subject of comparative tests. It would not be wise to draw any sweeping conclusion from these results, especially as the rocks least suitable for road-making are apt to splinter in the machine, and the most suitable rocks tend to break with a cubical fracture.

From the standpoint of the road engineer the percentage of chips detached during test may be taken as an indication of brittleness; but Mr. Lovegrove points out that, as chips help to maintain the fabric of the road crust, a moderately large percentage does not necessarily militate against the use of the stone for certain classes of work.

The percentage of dust produced by attrition tests is a valuable criterion by which to judge the merits or demerits of road metal, because every ounce of dust produced in actual practice represents absolute loss of money to the ratepayers and inconvenience to the public at large. In the case of rocks losing equal percentages of dust in dry tests, the loss in wet tests affords a useful indication of relative resistance to abrasion in wet weather. The differences exhibited by the results for dry and wet tests are shown by the table to be extremely varied, the loss in the wet test ranging from 0 to 282 per cent. more than that given by the dry test.

Specific gravity has no connexion with quality, and is merely given in the table as an approximate guide to freight charges.

Useful as the information collected in the table undoubtedly is, the results are not by themselves sufficient as an absolute indication for road wear. Recognising this fact, Mr. Lovegrove took steps with the object of securing the co-operation of the Geological Survey, so that the data furnished by his tests might be published in connexion with petrological descriptions and photo-micrographs of the materials examined. Accordingly, the records of tests conducted at the establishment of the Hornsey Borough Council, together with specimens of the rocks examined, were submitted to Dr. Flett, the petrographer to the Geological Survey and Museum, who prepared exhaustive reports, from which the "Petrological Descriptions," with photo-micrographic illustrations, occupying the greater part of the present publication, were collated by Mr. Howe, the Curator of the Museum of Practical Geology.

A minor disadvantage evidenced by comparison of Mr. Lovegrove's table with the petrological descriptions is that two entirely different systems of grouping have been adopted. Whether the discrepancy results from editorial inadvertence or from irreconcilable difference of opinion on the part of the collaborating authors we do not know. The practical effect of the conflicting groupings is that a certain amount of unnecessary trouble is entailed upon the reader who wishes to compare the results of tests with the corresponding petrological descriptions.

Following the notes by Dr. Flett and Mr. Howe are a discussion of the results, a series of general conclusions, and an additional table of results not previously made public. The record here presented and the collection of specimens at Jermyn-street should be found of the utmost value to road engineers and authorities, who have been compelled in the past to rely largely upon individual experience, and, as Mr. Lovegrove aptly says, to enter upon "the pursuit of guiding principles by means of wasteful experiment."

The Law Relating to Railway Traffic. By THOMAS WAGHORN, Barrister-at-Law, formerly Chief Accountant of the Buenos Ayres Great Southern Railway, etc. (London: Effingham Wilson. 1906.)

THIS little treatise forms one of a series of "Legal Handy Books," and in a very compact form appears to contain much useful information on a subject of considerable complexity, but one of much interest to the general public—the law relating to railway traffic. In the preface the author states that the statutes, rules, and orders relating to this subject occupy 304 pages of print in an octavo volume, of which he is also joint author, whilst in the same volume the decided cases occupy 500 pages; therefore in this treatise, which consists of 140 pages exclusive of the index, little can be done but to summarise the main principles, and this the author seems to have accomplished in a clear manner. The author accounts for the complication of the subject and of the legal decisions upon it by quoting from the Report of a Parliamentary Committee in 1853, which states that in the early history of railway legislation it was contemplated that the railway systems would only furnish new highways open to the public to use with engines and carriages at their own discretion—a view which presents points of interest in the now early development of motor traffic. We warmly endorse the author's remarks on the necessity for codification of the law, for, as in many other branches dealing with matters of everyday occurrence in daily life, the law relating to railways is in a condition that can only be comprehended by expert lawyers. We find no table of cases, and, as we have observed in connexion with other volumes of this series, we think this addition would much enhance the value of these volumes, and it would also be well in every instance when citing a decided case to give a reference to the Report where it is to be found. The task of compression is a difficult one, and the author seems successfully to have accomplished it in this work.

English Domestic Architecture of the XVIIth and XVIIIth Centuries. By HORACE FIELD and MICHAEL BUNNEY. (London: George Bell & Sons. 1905.)

THERE is probably no period in English domestic architecture that has contributed more to the picturesqueness and architectural value of our street architecture than that included within the scope of this very delightful volume. The city or market town that does not still preserve some examples in the material of the district, be it stone, brick, or wood and plaster, is fortunately the exception, and the perusal of these pages, and the fine photographs and measured drawings with which it is illustrated, will bring back to most the recollection of examples seen and noted, or of others of very similar character. With such a large number to choose from selection must have been a matter of considerable difficulty, but the authors have succeeded in bringing together a good series of typical examples of the time, and have done for the smaller type of house what has already in other works been done for the larger mansions of the Renaissance. In addition to this smaller type of dwelling-house the almshouse, "hospital," and market-hall are also illustrated, and some of the many doorways that abound in a great variety of forms. The counties of Somerset, Wilts, and Gloucester supply, as is natural, some of the best examples of building entirely of stone, and the street scenes in Tetbury, Cirencester, and Wootton Basset are good types of the charm of these old country towns. Bromley College, Kent, and the House of Matrons at the north-west angle of the close at Salisbury are the most important of the almshouse type illustrated, although equal praise should be given to the more modest, if equally dignified, treatment of others at Oxford, Bradford-on-Avon, Blandford, and Buntingford. The examples of houses have been taken from such widely different districts as Lancashire, Suffolk, the Midlands, and the south and south-western counties, but, as is noted by the authors in the preface, it is in the stone districts chiefly that the traditional type of house has been most completely preserved. In all about 200 examples are given, and with the concise notes on each, and the introductory chapter, together make up a volume which will be a possession to value by all interested in this essentially English development of domestic work, quiet and refined, and of excellent proportion, equal in value to the more elaborate examples which have been described and illustrated of late years in other volumes.

Memorials of Old Hampshire. Edited by G. E. JEANS, M.A., F.S.A. (London: Bemrose & Sons. 1906.)

THIS volume consists of a series of twenty papers, and rather more than half the number deal with subjects of architectural interest. The opening chapter by the editor describes generally the chief points in the church work of the county, which, although not rich in comparison with neighbouring counties so far as its parish churches are concerned, could never be considered poor architecturally, as it possesses within its borders the grand buildings at Winchester, St. Cross, Romsey, and Christchurch, Twyneham, and the beautiful detail in the ruins of Netley and Beaulieu Abbeys. With the exception of the Cathedral all the foregoing are dealt with in separate papers, and there is a highly interesting and valuable chapter on the wall-paintings of the county, from the pen of that well-known authority on the subject, Mr. C. E. Keyser. Wolvesey Castle, Winchester College, and the houses at Bramshill, Place House, and Basing are also described, and the stirring events connected with the siege and heroic defence of Basing House are well told by the Rev. G. N. Gibson. The description of the conventional buildings at Netley Abbey, however, requires some revision before they can be accepted as correct. The building south of the chapter-house on the east side of the cloister was certainly not the refectory but the sub-vault of the dormitory. The refectory stood on the south side of the cloister, was placed at right angles to the church, and the traces of the entrance to it have survived the Elizabethan alterations which were made on its site, and which no doubt caused its destruction.

The work throughout is very fully illustrated with a number of fine full-page photographic plates. Those of the Norman font and elaborate altar screen at Winchester Cathedral, of the east end of the Abbey Church at Netley, the pulpit at Beaulieu, and the frescoes at Bramley and Catherington are particularly good. In addition to the foregoing are chapters on Silchester and the excavations there, on the Jutish Settlement in the Meon Valley, on Southampton, the New Forest and Portsmouth, and a short notice of the traces of the Knights Hospitallers at North Baddesley. It is a work which should find many readers, as it treats of one of the most interesting perhaps of our English counties.

The Cathedrals of England and Wales. By T. FRANCIS BUMPUS. (London: T. Werner Laurie. 1906.)

THE third and last volume includes the Cathedrals of Lichfield, Gloucester, Rochester, Carlisle, Oxford, Ripon, and St. Albans, the four Welsh Cathedrals, and the churches of the modern sees of Manchester, Wakefield, Southwark, and Truro, Liverpool, and Birmingham. The illustrations, as in the two former volumes, are chiefly from photographs of the actual buildings; one or two are from old engravings. The most interesting perhaps in the present volume are those of the exterior and interior of St. Albans, taken in 1870, before the recent restoration so altered the appearance of both, the interior of the nave of Ripon showing the curious arrangement at the "crossing," and the fine group formed by the buildings at Southwell as seen from the north-east. The letterpress is very full of interesting facts relating to the history and buildings of each cathedral, brightly and clearly written; and the whole series will make a useful book of reference for those who do not care for the more technical descriptions of other works on this ever-fascinating subject.

A Glossary of English Architecture. By T. D. ATKINSON. (Methuen. 1906.)

ACCORDING to statements in the preface, the author limits this glossary to the historical aspect of architecture, and includes "only incidentally words used in art and in building." As art and construction lie at the very root of the matter, it is not clear how such terms could well be dispensed with in a book of the sort. The publication is about the same size as Parker's "Concise Glossary," but it does not contain as many definitions. On the other hand, it includes many words which are not found in Parker, and devotes more space to excellent short articles on houses and churches rather than to purely architectural terms.

It is a pity that Gwilt's erroneous definition of Boule work as being "wood inlaid in wood" should be quoted, and the confining of strap ornament to the pierced tracery of Elizabethan parapets seems an unnecessary restriction of the term. But in the main the definitions, as well as the profuse illustrations, chiefly by the author, are good. The appendix contains several useful tables, one of the most interesting being a list of about 100 saints, with the manner in which they are represented.

Heraldic Badges. By A. C. FOX-DAVIES. (London: John Lane. 1907.)

WHAT the author modestly terms a "short essay" is an account, so far as they are at present known, of the origin, history, and use of badges, which will be of value to all interested in the fascinating study of heraldry. Although, according to Mr. Fox-Davies, there seems to be no known instance of the actual grant of a badge as a badge, their use in the Middle Ages was of considerable extent, as the goodly list of examples which the author gives clearly shows. They have more than ordinary interest in connexion with architectural work in that they take very often so conspicuous a place in the decoration of ancient buildings. There are few, indeed, of our cathedrals, or of churches in any way connected with the great mediæval families, that have not examples, and, together with the "rebus," which must not however be confused with the badge, they are introduced in great variety on buildings and monuments, and are also to be found in stained glass and on tile pavements. The well-known Warwick badge, the "Bear and Ragged Staff," is still to be seen in the paving at Tewkesbury Abbey, the chained swan of the Bohuns and the knot of the Staffords at Malvern; the running horse in front of an oak tree, the badge of Thomas Fitz Alan, Earl of Arundel, is carved on the face of a buttress at Boxgrove Priory; and in one of the windows at St. Decuman's Church, in Somerset, is a good representation of the "Planta Genista" of the Plantagenet dynasty. Perhaps one of the best-known examples of a monument decorated profusely with badges is that of Prince Arthur, at Worcester Cathedral. The Stafford family had no fewer than eighteen badges here illustrated, and these pages show what a very important part this branch of heraldry played in the Middle Ages. Numerous illustrations are given chiefly from old examples; many are from "Prince Arthur's Book," now in the possession of the College of Arms.

Portfolio of Measured Drawings. School of Architecture, the University of Liverpool. (The University Press. 1906.)

THE preface explains that "during the last two years a set of measured drawings of some approved building, together with a thesis on it, and similar work, has been required from students proceeding to a Bachelor Degree in Arts in the Honours School of Architecture. In this way the majority of the drawings here reproduced have come into existence." The present volume, the first of an intended series, includes measured drawings and details of the Town Hall at Liverpool, river front of the Custom House at Dublin, the Orangery at Kensington Palace, the Senate House at Cambridge, and the two well-known palaces at Versailles, the Grand and Petit Trianon. Additional interest and value are given to these drawings by photographs of the buildings, and the whole forms a very interesting series, with explanatory notes.

Alphabets Old and New. By LEWIS F. DAY. (London: B. T. Batsford. Second Edition. 1906.)

THE first edition of this interesting and useful work has already been noticed in our pages. The second edition has, with its additional information on the subject, over two hundred examples of lettering and numerals, partly, as the title indicates, from old examples and partly from modern sources, to which later the author is a considerable contributor. The old examples have been obtained from specimens in wood, stone, and metal, and to all requiring good and authentic examples of alphabets this little book will be invaluable.

Architectural Sketching and Drawing in Perspective. By H. W. ROBERTS. (London: B. T. Batsford. 1906.)

THE author, the inventor of "R.'s" method of perspective, which is doubtless already known to many of our readers, has in this work based most of the drawings on that method. The drawing of an architectural perspective is, in actual fact, such a simple matter, only requiring practice and the exercise of thought and common-sense, that books on the subject always appear to be unnecessarily complicated; but no doubt those who peruse the pages and illustrations of this work will find the description as simple and straightforward as seems to be possible when writing on the subject.

Quaint and Historic York. From Drawings by E. RIDSDALE TATE, and Notes by GEORGE BENSON. (London: B. T. Batsford. Edinburgh: W. J. Hay. 1906.)

THE twelve drawings by Mr. Tate are apparently photographic reproductions of carefully-finished pencil sketches, and illustrate some of the picturesque streets of the city, its walls and "Bars," for which it is so well known. The history of each building illustrated is given in the notes, and the whole is issued in an ornamental cover.

The "Mechanical World" Pocket Diary and Year-Book for 1907. (Manchester: Emmott & Co.)

THIS, the twentieth annual issue of a very convenient collection of useful data, formulæ, and tables, has been entirely reset in new type, and, among other new matter, contains additional information relative to gas and oil engines and a section on suction gas producers. The book will be found nearly as useful to architects and builders as to engineers.

ST. PETER'S CHURCH, STOCKTON.—The dedication of the new tower at St. Peter's Church, Yarm-road, Stockton, took place recently. The tower is square and built of red brick, with stone ornamentation. Mr. Richardson was the architect of the work. The cost has been about 1,000*l*.

EMMANUEL CHURCH, LEEDS.—On the 17th inst. the Bishop of Ripon dedicated the new tower and spire of Emmanuel Church, Woodhouse-lane, Leeds. The work has been carried out from designs by Mr. H. S. Chorley, of the firm of Messrs. Chorley, Connon, & Chorley, architects, Leeds.

Correspondence.

THE CRŒSUS TEMPLE AT EPHESUS.

SIR,—Mr. Hogarth informed us on Monday evening that Mr. Henderson's drawings would be published towards the close of next year, when we should be better able to follow his restoration of the Archaic Temple. But there are one or two questions to which I should have liked to draw attention in that restoration, which are independent of the measurements taken by him, had I caught the Chairman's eye.

Firstly, Mr. Henderson has based his restoration of the Crœsus Temple on Pliny's description of the Hellenistic Temple, and although we know that they occupied the same site, and in some cases the bases of the latter were found some feet above those of the former, and a photograph was exhibited of one instance in which they are both shown *in situ*, it does not necessarily follow that there were the same number of columns in the two Temples, so that the difficulty of knowing where to locate the 127th column does not arise.

Secondly, Mr. Henderson exhibited a conjectural restoration of the Portico of the Crœsus Temple, but did not show the return of the angle capital on the flank, and this is the crux of the whole question. He suggested an angle volute, but as, on the return, the capital could only be half the width, its design would have resembled the grotesque example at Telmissus. Personally, I have always looked upon the capitals of the Archaic Temple as belonging to columns placed *in antis* between walls or piers, and I should have had the courage to indicate a pier at each angle of the Portico as the only solution of the problem.

Thirdly, whilst agreeing with Mr. Henderson in the omission of the frieze from his entablature, I am at a loss to understand why he should not have included the chief characteristic of *all the Ionian Temples*, viz.: the deep projecting dentil course. This would have enabled him to give a greater thickness, in his section, to the roof, which is now reduced to a feather edge, and might have dispensed with the broken pediment shown in his restoration, broken not at the top, but towards the lower end or east side.

That which must have struck all those who followed Mr. Henderson's description the other evening was the extraordinary patience, perseverance, and energy which he had devoted to the measurement of every fragment on the site, and the delineation of one of the most elaborate plans I have ever seen, and, when published, those drawings will have an exceptional value as possibly the last record which will be made of the famous temples on the site.

R. PHENÈ SPIERS.

THE ZODIAC IN FRENCH CHURCHES.

SIR,—It may be of interest to contrast the use of the zodiac in French churches, with that in English, as already enumerated. The following instances are all that I know of:—

1. *Outside Churches.—Wall:* On the east wall of S. Paul, Issoire, are twelve medallions of the signs—Xth century—let in under the cornice. "Dictionary of Architecture," Murray: "France," 1852, p. 388.

2. *Doorways.*—In mosaic on the great doorway of Notre-Dame Cathedral, Rheims, XIth century. "Dict. Arch.": "Archæologia," xliv. On the pedestal of the right-hand doorway of the Abbey Church S. Denis. "Archæologia," xliv. Engraved in Hugo: "France Historique et Monumentale," 1836, iv. 2, 4, 9; also in Lenoir: "Des Arts," pl. 20; and a cast of it in Salle A., No. 78, Trocadéro, Paris. With the month occupations, around the great door of Chartres Cathedral, XIIth century. Fowler: "Archæologia," xlix.; Higgins: "Anacalypsis," i., 20; Le Duc: "Dic. de l'Arch.," ix., 551.; Murray, 114; pencil drawing of it in Salle C., Trocadéro; and photograph of it in Salle B., Trocadéro. Cathedral at Bazas. "Archæologia," xliv.; Murray, 114; "Annales Archéologiques"; cast of it in Salle A.; and photograph of it in Salle C., Trocadéro. With the month occupations alternately, Autun Cathedral; photograph of it in the Trocadéro. In the Ecole des Beaux Arts, Paris, taken from S. Geneviève. "Musée des Mon. Français," 1800-6, vii., No. 514; Lenoir: "Statisque de Paris," 1843; engraved in Lenoir: "Des Arts de France," 1811, xxiii. Very large, on the left hand portail, in two rows of quatrefoils, with month occupations under each sign. Amiens Cathedral. "Archæologia," xliv.; "Dict. Arch." Around the Porte de la Vierge, grand

façade, Notre Dame Cathedral, Paris, perhaps the most remarkable mediæval church zodiac in France, *circiter* 1200. "Dict. Arch."; Lenoir: "Musée Imperial des Mon. Franc.," 1810; Vincent-Magasin: "Encyclopædie," Sept., Oct., 1815; Guilhermy et le Duc: "Descr. de Notre Dame, 1856"; *Notes and Queries*, No. 188. On the two jambs of the north portail, grand façade, Notre Dame, Paris, with the month occupations, 1223. Engraved in "Mankind," xxiii., 478; a cast of it in Salle B., No. 86, Trocadéro. S. Stephen's Cathedral, Sens, XIIIth century. "Archæologia," xliv.; "Dict. Arch."; "Annales Arch.," xii., 129; Caumont: "Abécédaire d'Archæologique," 305. In the archivolt, Germigny Church. Allur: "Ancien Bourbonnais," Moulins, 1832; Lafosse: "La Loire Historique," 1886, II. ii., 585. With the month occupations, S. Marcellin, Amiens. "Dict. Arch." On Plaisance Cathedral. "Archæologia," xliv; "Annales Arch.," xiv., 160. Over the transept doorway, Vienne Cathedral, "a very Brueghel creation of horrors," Romanesque, XVth century. Gould: "In Troubadour Land," 1891, 304. Finely sculptured, with angels, men, etc., in grand façade, Ste. Croix, Bordeaux. Lamothe: "L'Architecture au Moyen Age"; on a cabinet photograph. Around the portail du Narthax of the Abbey Church, Madeleine, Vezelay, XIIth century, with the twelve Apostles to correspond, in twenty-four concave plaques, 13 in. by 16 in., and month occupations. "Archæologia," xlix., xliv.; Murray, 350; pencil drawing of it, by le Duc, 1840; and cast of it in Salle A., No. 78, Trocadéro.

3. *Façade.*—On Civry Church. "Dict. Arch."; Murray, XIIth century.

4. *Inside Churches.*—Pavements, mosaic tablets, S. Bertin. S. Omer, five signs with spheroids, intaglio relevato, originally in the choir. With the month occupations, Chapel of S. Firmin, S. Denis. "Dict. Arch."; engraved in Lenoir: "Atlas," xi. In mosaic, before the high altar, Lyons Cathedral, XIVth century. Higgins, i., 69, ii., 57; "Archæologia," xlix.; "Dict. Arch."

5. *Font.*—Round a lead font, in arched, pillared recesses, with the month occupations below in others, at S. Evroult de Montfort; pencil drawing of it, by le Duc, 1840, in Salle C., Trocadéro.

6. *Windows.*—In a wheel window, grand façade, Notre Dame, Paris, 1200. "Archæologia," xliv; Higgins. Wheel window, Laon Cathedral. Jennings: "Rosicrucians," i., 211. In a circle, in a wheel window, S. Denis Abbey. In circles, around a Madonna, in a large wheel, stained window, S. Augustine, Paris, *circiter* 1860.

7. *Chancel.*—Painted on the chancel arch, Pritz, XIIIth century. "Dict. Arch."; Caumont: "Abécédaire," 1854, 375, 376.

8. *Roof.* — Notre-Dame Cathedral, Paris. "Académie Scientifique."

9. *Clock.*—Lyons Cathedral. Knight: *Penny Magazine*, 1840, 386.

10. *Screen.*—Carved in the open work, on a wooden screen behind the high altar, S. Germain des Prés, Paris, in four divisions.

11. *Walls.*—Painted on the arms of a S. George's cross on the left-hand transept wall, with Scripture scenes between the arms, S. Germain des Prés, Paris, XIXth century. On the under side of the nave arches of S. Germain are, bull, ram, scorpion, etc.

There is a zodiac in some part of Senlis Cathedral, and a very perfect one in Copford Norman Church. D. J.

LETCHWORTH GARDEN CITY COTTAGES.

SIR,—My attention has been called to a paragraph in your paper which implies that those who were responsible for the Cheap Cottages Exhibition of 1905 were probably deceived by many of the exhibitors as to the cost of the cottages built. I will not go into details upon the point which gave rise to your remarks, since there is plainly a mistake in them. They say that a builder exhibited "some 180*l.* cottages" which in reality cost 230*l.* As a matter of fact, that builder exhibited one 150*l.* cottage. It is with the more general imputation that I would prefer to deal.

The Exhibition was so novel, and in many ways tentative, that it is not surprising that some of the public who did not read the conditions very carefully should have misunderstood them, and, further, should have judged the Exhibition by the worst cottages, a method as unsatisfactory as though one judged the standard of an examination by the wrong answers of candidates who failed ignominiously to pass the examination.

The aim of the Exhibition was to see whether a cottage could be built at the net cost of 150*l.* to a builder building in his own neighbourhood—and this was proved beyond all doubt. It did not pretend to prove that any of those who exhibited would build a single cottage in any part of Great Britain for a gross payment of 150*l.* That most variable item, the builder's profit, was not taken into account, nor for the purposes of competition could carriage be fairly counted, since builders from as far as Darlington were competing against local builders. Cartage from the goods' yard was charged against distant competitors, and local builders had to account for their carting. The only other item not counted was the gas-fittings, and this because they were not considered an indispensable part of a rural labourer's cottage; the fittings were only inserted, at the request of the Garden City Company who had laid gas mains, to avoid pulling the houses about at a later date.

I cannot deny that some of the cottages cost more than the sum stipulated for. Some builders regretfully acknowledged that they had found they could not get within a pound or two. Some, who caused considerable annoyance, more intent on advertising than on the competitions or upon solving the question of rural housing, and so spent recklessly upon making their cottages attractive. But it would not have been possible to order them to remove their cottages, nor would it have been desirable to forego any knowledge of their methods or materials which might well prove useful. But the point is that these facts were all known to the very able body of judges. We had a most competent clerk of works and quantity surveyor. Throughout the whole time when the building was going on he was always on the spot with a large notebook in which was written everything which the judges should know and which would not be apparent to their eyes after completion. With these notes he could check all statements of the builders. In many cases it was not necessary, but all those builders who were, towards the end of the judging, in the running for a prize had to submit all their vouchers, receipts, bills of quantities, pay-sheets, etc. I can therefore guarantee that none of the dozen prize-winners failed to keep to the conditions set, and thus they proved that a man ought to be able to build cottages in his own neighbourhood for 150*l.* plus profit. Of course, there may be districts where the conditions are very difficult, but one covers a very large area of rural England when one says that the conditions of the Exhibition apply to all parts which are either within a reasonable distance of brickfields, or of timber ports or locally-used timber, or of the ingredients of concrete, or of the places were certain slabs or other patent materials are made. As to restrictive by-laws the remedy is in the hands of the local people. The Exhibition cottages all conformed to the by-laws of the Hitchin Council, which adopted the model code of the Local Government Board for rural districts. As to estates upon which quarries or brickfields are regularly worked or timber is felled and handled, there the material can be called for at any time, and the Exhibition showed in many ways how the planning and construction can be improved and cheapened.

WILBRAHAM S. COOPER,
Secretary of the Cheap Cottages Exhibition, 1905.

*** We did not say that any prize-winners did not gain their prizes fairly. We said that the committee were deceived in one case and might have been in others. We asked the representative of two very good cottages which were put down at a wonderfully low sum in comparison with their appearance, whether they really undertook to build them for that sum. He laughed, and said—"We built them *here* for that, but we are not going to do it anywhere else."—ED.

KLEINE FLOORING TEST.

SIR,—In your issue of the 10th inst. a report appears on page 541 of a test of "Kleine" flooring. It is stated that "Floor A," which was subject to a load test, had a bearing of 13 ft. 1½ in. between the supports. I was present at the test and roughly measured the distance as 12 ft. between the centres of the rolled joists on which the bricks were supported, the floor projected a certain distance beyond the bearings at each end. The timbers with which the sand was enclosed were 6 in. high, so that the sand was 6 in. thick—not 7 in. as stated in your report. The result of the test goes to show that in floors of this type the efficacy of the structure depends altogether on the manner in which the iron bars are embedded in the joints and the manner in which the ends are screwed, so as to avoid the bars being drawn out. Too much stress cannot be laid upon the importance of the workmanship in reinforced structures, whether of concrete or tile, and it is with the object of bringing this before your readers that I make these observations.

MAX CLARKE.

*** We have to thank Mr. Max Clarke for directing our attention to two of the dimensions given in our issue for the 10th inst. The full length of the floor tested was 13 ft. 1½ in. as stated, but the clear span between supports was only 12 ft., and the sand spread over the surface was struck off level with the enclosing timbers before the load was applied, thus making its depth 6 in. It should be added that the corrected span does not in any way affect the stated loads per square foot, which were calculated in each case for the net area. The precise depth of the sand is, of course, quite immaterial. While agreeing that good workmanship in every detail is very important for reinforced floors of every kind, we cannot indorse the restricted view that their stability "depends altogether upon the manner in which the iron bars are embedded and the ends are screwed." (We presume the last word to be a clerical error, and that Mr. Clarke meant to say "secured.") The quality, method of application, and condition of the concrete are even more important factors, for while bars with split or bent ends are firmly held by good concrete, no mode of fastening the ends will avail if the concrete is of poor quality and only partly set. In that case failure of the concrete in compression and the augmented strain upon the tension bars are sure to cause failure of the construction as a whole. The results of Mr. Walmisley's test shows unmistakably that defective concrete was essentially the cause of the premature collapse, and, considering all the circumstances, we do not think it justifies the inference that the reinforcement was imperfectly designed.—ED.

ESCAPE IN CASE OF FIRE.

SIR,—The value of your admirable leading article of last week is, unfortunately, somewhat discounted by an initial error in the reading of the law. At the commencement reference is made to the "statutory" duty of the Council, and a few lines lower it is stated that a "function to call upon the owners of buildings to provide such proper means of escape as are required under the Act" has been "assigned to the Council." This is only accurate as regards sects. 7 and 9, and does not apply to cases of projecting shops and access to roof (sects. 10 and 12) with which the article particularly deals.

When the Bill left the House of Commons the District Surveyor was required to "as soon as he discovers that such building is not in conformity with such provisions to serve on the owner thereof or on the builder a notice requiring him to carry out all such works as may be necessary to bring the building into conformity with such provisions. Any such notice shall be enforced in like manner as a notice of irregularity under the Act of 1894." This left the whole duty of enforcing these sections with the District Surveyor, and provided the necessary machinery: however, for some reasons best known to themselves, the opponents of the Bill secured in the House of Lords an alteration to this section, so that the District Surveyor is now to "report such non-conformity to the Council." Beyond this report, and the liability of the owner to a penalty for not complying with the sections, the Act makes no provision for enforcing the law, no notice or warning is required to be served on the owner, who is liable, without any notice, to the penalties dating from January 1 last. No special authority having been given to the Council or the District Surveyor to enforce these sections it is competent for any member of the public to take proceedings as a common informer. The Council have, however, assumed to themselves this duty, and the delay in acting upon the reports of the District Surveyors, in many cases extending to several months, is hardly consistent with their attitude when the Bill was before Parliament.

An alteration to the present state of affairs is much to be desired, and the natural remedy would seem to be for the District Surveyors to take up the work as was originally intended, instead of the Council, who have shown their inability to cope with the difficulty. X.

The Student's Column.

ROOFS: STRUCTURALLY CONSIDERED.—XVIII.

21. *The Complete Design of a Timber Truss (continued).*

FURTHER details of the roof design represented in Fig. 154 are considered in this article.

(*h*) *Steel Ties.*—Referring to Table XXXVIII., it will be found that theoretically there is no stress in the tie $P_1 L_1$, and this member might be omitted without affecting the stability of the truss.

But in that case the tie-beam would be unsupported for a length of 20 ft. between L_0 and L_2. Therefore it is desirable to provide an intermediate tie to prevent the slight deflection that would otherwise occur. For this purpose a rod of ¾-in. diameter is ample, as, taking the permissible tensile stress for steel from the table in *par.* (*a*), p. 513, and the net area at the bottom of the screw-threads at 0·3038 sq. in., the rod is capable of resisting without undue strain a total tensile force of

$$16{,}000 \times 0{\cdot}3038 = 4{,}860 \text{ lb.}$$

The tie $P_2 L_2$ has to withstand a tensile force

of 5,000 lb., and requires to have the effective area of

$$5{,}000 \div 16{,}000 = 0{\cdot}3125 \text{ sq. in.}$$

By the British standard specification for screw threads the cross-sectional area at the bottom of the thread of a ¾-in. bolt is 0·3038 sq. in. This being a little too small, we adopt ⅞ in.—the next size in general use—with the net sectional of 0·4216 sq. in.

For convenient reference we give in Tables XL. and XLI. particulars of British standard Whitworth screw threads and Whitworth standard bolt heads and nuts.

TABLE XL.—BRITISH STANDARD WHITWORTH SCREW THREADS (¼ INCH TO 3 INCH).

Full Diameter.		Threads per Inch.	Pitch.	Standard Depth of Thread.	Effective Diameter.	Core Diameter.	Cross Sectional Area at Bottom of Thread.
Inch.	Inch.	Number.	Inch.	Inch.	Inch.	Inch.	Square Inch.
¼	0·25	20	0·0500	0·0320	0·2180	0·1860	0·0272
5/16	0·3125	18	0·0556	0·0356	0·2769	0·2414	0·0458
⅜	0·375	16	0·0625	0·0400	0·3350	0·2950	0·0683
7/16	0·4375	14	0·0714	0·0457	0·3918	0·3460	0·0940
½	0·5	12	0·0833	0·0534	0·4466	0·3933	0·1215
9/16	0·5625	12	0·0833	0·0534	0·5091	0·4558	0·1632
⅝	0·625	11	0·0909	0·0582	0·5668	0·5086	0·2032
11/16	0·6875	11	0·0909	0·0582	0·6293	0·5711	0·2562
¾	0·75	10	0·1000	0·0640	0·6860	0·6219	0·3038
13/16	0·8125	10	0·1000	0·0640	0·7485	0·6844	0·3679
⅞	0·875	9	0·1111	0·0711	0·8039	0·7327	0·4216
15/16	0·9375	9	0·1111	0·0711	0·8664	0·7952	0·4966
1	1·0	8	0·1250	0·0800	0·9200	0·8339	0·5540
1⅛	1·125	7	0·1429	0·0915	1·0335	0·9420	0·6969
1¼	1·25	7	0·1429	0·0915	1·1585	1·0670	0·8942
1⅜	1·375	6	0·1667	0·1067	1·2693	1·1616	1·0597
1½	1·5	6	0·1667	0·1067	1·3943	1·2866	1·3001
1⅝	1·625	5	0·2000	0·1281	1·4969	1·3689	1·4718
1¾	1·75	5	0·2000	0·1281	1·6219	1·4939	1·7528
1⅞	1·875	4·5	0·2222	0·1423	1·7327	1·5904	1·9866
2	2·0	4·5	0·2222	0·1423	1·8577	1·7154	2·3111
2¼	2·25	4	0·2500	0·1601	2·0899	1·9298	2·9249
2½	2·5	4	0·2500	0·1601	2·3399	2·1798	3·7318
2¾	2·75	3·5	0·2857	0·1830	2·5670	2·3841	4·4641
3	3·0	3·5	0·2857	0·1830	2·8170	2·6341	5·4496

The tie P_3 L_0 has to withstand the tensile force of 16,100 lb., the effective area required being

$$16{,}100 \div 16{,}000 = 1{\cdot}06 \text{ sq. in.}$$

As the net area of 1·0597 sq. in. is given by a 1¼-in. diameter rod, that size can be adopted.

But the area of a 1¼-in. diameter rod ($1{\cdot}25^2 \times 0{\cdot}7854$) = 1·227 sq. in. is ample in itself. Therefore, by upsetting the ends to the diameter of 1⅜ in. and screwing them with the same-sized thread the effective

TABLE XLI.—WHITWORTH STANDARD BOLTS AND NUTS (¼ INCH TO 3 INCH).

Diameter of Bolt.		Bolt Head and Nuts.		
		Width Across Flats.	Width Across Corners.	Height of Bolt Head.
Inch.	Inch.	Inch.	Inch.	Inch.
¼	0·25	0·5156	0·6093	0·2187
5/16	0·3125	0·6093	0·6875	0·2656
⅜	0·375	0·7031	0·8125	0·3281
7/16	0·4375	0·8281	0·9531	0·3750
½	0·5	0·9062	1·0625	0·4375
9/16	0·5625	1·0156	1·1562	0·4843
⅝	0·625	1·1093	1·2656	0·5468
11/16	0·6875	1·2031	1·3906	0·5937
¾	0·75	1·2968	1·5000	0·6562
13/16	0·8125	1·3906	1·5937	0·7031
⅞	0·875	1·4843	1·7031	0·7656
15/16	0·9375	1·5781	1·8281	0·8125
1	1·0	1·6718	1·9531	0·8750
1⅛	1·125	1·8593	2·1562	0·9843
1¼	1·25	2·0468	2·3593	1·0937
1⅜	1·375	2·2187	2·5468	1·2031
1½	1·5	2·4062	2·7812	1·3125
1⅝	1·625	2·5781	2·9687	1·4218
1¾	1·75	2·7500	3·1875	1·5312
1⅞	1·875	3·0625	3·4843	1·6406
2	2·0	3·1562	3·6250	1·7500
2¼	2·25	3·5468	4·0937	1·9687
2½	2·5	3·8906	4·4843	2·1875
2¾	2·75	4·1875	4·8281	2·4062
3	3·0	4·5312	5·2343	2·6250

areas will be 1·227 sq. in. in the body of the rod and 1·4718 sq. in. at each end.

Either alternative may be adopted, but, as the rod with forged ends requires larger holes through the tie-beam, and as the metal saved by using the thinner rod would be counterbalanced by extra labour, we adopt the 1¼-in. diameter rod.

(j) *Tie-beam and Rafter Joint.*—Several methods of connecting tie-beams with principal rafters are illustrated in Figs. 123 to 129, p. 402. We will now consider these types of joint, with the object of determining their relative suitability for the roof now under discussion.

Fig. 123 represents a type of joint in very general use. It is usually the case that too much faith is reposed in the resistance of the abutment constituted by the notch in the tie-beam and in that of the fibres at the end of the rafter.

When the toe of the rafter presses against the abutment the tendency is to shear off the upper portion of the tie-beam along the plane represented by the line *a b* in Fig. 157. Resistance to the longitudinal shearing force so exerted is governed by the strength of the material and the area of the plane.

By the table in *par.* (*a*), p. 513, the permissible shearing stress along the grain of the timber used in the present roof design is 150 lb. per square inch; the width of the tie-beam has been calculated at 6 in., and we will take 16 in. as the distance between the abutment and the end of the tie-beam.

Then the safe resistance to shear is

$$150 \times 6 \times 16 = 14{,}400 \text{ lb.}$$

Similarly, the resistance of the toe of the rafter against crushing is represented by the compressive strength of the material, the width of the rafter, and the depth (*cd*, Fig. 157) of the part which bears against the abutment in the tie-beam.

By the table in *par.* (*a*), p. 513, the permissible compressive stress of the timber is 1,600 lb.; the width of the rafter has been calculated at 6 in., and we will assume the abutment to be 1½ in. deep.

Then the safe resistance of the rafter toe will be

$$1{,}600 \times 6 \times 1{\cdot}5 = 14{,}400 \text{ lb.}$$

Thus the value of the notch is 14,400 lb. No account is taken of the resistance afforded by the tenon and mortise, or of friction between the surfaces.

Table XXXVIII. shows the total thrust exerted by the principal rafter upon the tie-beam to be 34,500 lb., of which part is resisted by the timber joint, leaving the remainder to be taken by bolts.

As shown in Fig. 156, the horizontal component, 14,400 lb., corresponds with the portion 17,300 lb. of the total force, and leaves 17,000 lb. for the bolts.

If preferred, the remainder can be calculated as follows:—

$$\begin{aligned} &34{,}500 - (14{,}400 \div \cos 33^\circ\ 40') \\ &= 34{,}500 - (14{,}400 \div 0{\cdot}8322) \\ &= 34{,}500 - 17{,}300 = 17{,}200 \text{ lb.} \end{aligned}$$

To determine the total tensile force on the bolts we resolve the remainder 17,200 into two components, one horizontal and the other in the direction of the bolts.

Fig. 156 shows that the values of the two components are 14,300 lb. and 25,800 lb. respectively, the latter representing tension in the bolts.

By *par.* (*a*), p. 513, the permissible unit stress on steel bolts is 16,000 lb., and the effective area of metal must be 25,800 ÷ 16,000 = 1·612 sq. in.

The cross-sectional areas at the bottom of British standard Whitworth screw threads for three probably suitable sizes of bolts, together with some other data relative to the joint in question, are given in Table XLII.

TABLE XLII.—BOLTS FOR TIE-BEAM AND RAFTER-JOINT. (L_0 P_1)

Size.	Net Area per Bolt.	Number of Bolts.	Total Net Area of Metal.
in.	sq. in.		sq. in.
¾	0·3038	6	1·8228
⅞	0·4216	4	1·6864
1	0·5540	3	1·6620

Before deciding whether six, four, or three bolts should be applied, let us inquire into the sizes of the washers or plates necessary for distributing the tension from the bolt heads and nuts over the fibres of the timber.

Each ¾-in. bolt has to withstand the tensile force of $\frac{25{,}800}{6} = 4{,}300$ lb., and as the permissible compressive stress across the fibres of the rafter is 350 lb. per square inch, the area of the washer must be $\frac{4{,}300}{350} = 12{\cdot}3$ sq. in., or, including a ⅞-in. hole for the bolt (12·3 + 0·6) = 12·9 sq. in.

The area of the washer for each ⅞-in. and 1-in. bolt with 1-in. and 1⅛-in. holes, respectively, would be—

$$\frac{25{,}800}{4 \times 350} + 0{\cdot}7854 = 19{\cdot}21 \text{ sq. in.}$$

$$\frac{25{,}800}{3 \times 350} + 0{\cdot}9940 = 25{\cdot}56 \text{ sq. in.}$$

The following are the corresponding sizes of round and square washers:—

$$dia. = \sqrt{a \frac{\pi}{4}} \qquad side = \sqrt{a}$$

3·1 in.	3·52 in.
4·0 in.	4·38 in.
4·5 in.	5·06 in.

These dimensions show that for a rafter 6 in. wide separate washers would be out of the question for ¾-in. and ⅞-in. bolts arranged as in Fig. 157, but might be used for 1-in. bolts.

A better plan would be to employ a steel plate beneath the heads of all the bolts, making the size of the plate 6 in. wide by, say, 20 in. long.

The thickness of the plate may be calculated by considering either end as a cantilever and the part between any two bolts as a beam.

In the case of ¾-in. bolts, the end of the plate projects about 3¼ in. beyond the bolt heads, the load per square inch is

$$25{,}800 \div (6 \times 20) = 215 \text{ lb.,}$$

and the total load on the cantilever is

$$215 \times 6 \times 3{\cdot}25 = 4{,}192 \text{ lb.}$$

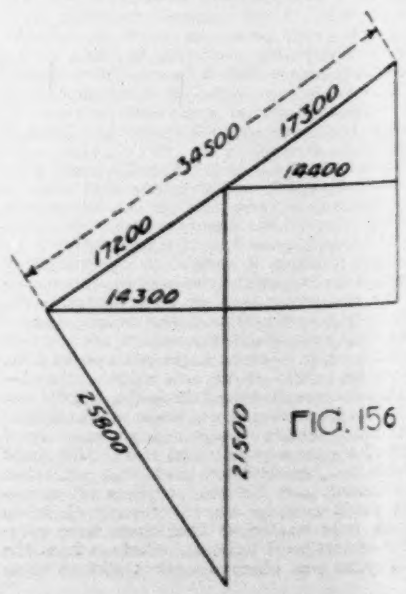

FIG. 156

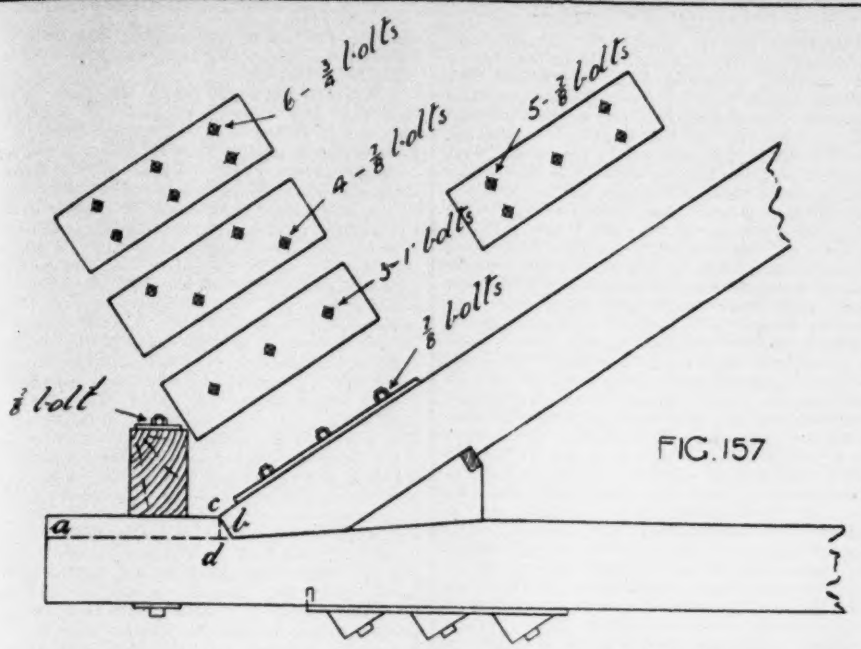

FIG. 157

Then by the usual rule the bending moment is

$$M = \frac{Wl}{2}$$

$$= \frac{4,192 \times 3{\cdot}25}{2} = 6,810 \text{ in.-lb.}$$

This moment must be balanced by the safe moment of resistance of the section.

Therefore, as by formula (29)

$$R = \frac{f b d^2}{6}$$

the value of d^2 is thus found. Taking 16,000 lb. as the permissible stress for steel,

$$R = \frac{16,000 \times 6 \times d^2}{6} = 16,000\, d^2$$

and the thickness of the plate must be

$$d = \sqrt{\frac{6,810}{16,000}} = 0{\cdot}65, \text{ say, } \tfrac{3}{4} \text{ in.}$$

To test whether this thickness will suffice for the spans of $(6 - 1\frac{1}{2}) = 4\frac{1}{2}$ in. between the three pairs of bolts, we must take the total load at

$$215 \times 6 \times 4{\cdot}5 = 5,805 \text{ lb.}$$

Then by the usual rule the bending moment is

$$M = \frac{Wl}{8}$$

$$= \frac{5,805 \times 4{\cdot}5}{8} = 3,265 \text{ in.-lb.}$$

Further calculation is unnecessary, because this value is less than half that found for the cantilever ends of the plate.

If ⅞-in. bolts were used and spaced as in Fig. 157, the plate should be a little thicker, say, ⅞ in., to allow for the zig-zag spacing of the bolts. For 1-in. bolts the ¾-in. plate is of ample thickness.

The next thing is to provide for transmitting the tension in the bolts to the tie-beam and to make provision for the horizontal component of the tension.

It is obviously undesirable to cut into the tie-beam more than can be helped. Therefore we must ascertain what would be the effect of employing a plate with bevelled bosses or collars, as shown in Fig. 157.

The thickness of the plate will be the same as calculated for the upper side of the rafter, but to provide for the angle formed by the direction of the bolts and the axis of the tie-beam the plate must be 24 in. long. Therefore the dimensions will be 6 in. by 24 in. = 144 sq. in.

As the vertical component of 25,800 lb. is only (25,800 *cos.* 33° 40′) = 21,470 lb. (see Fig. 156), compressive stress in the timber across the grain will be reduced to

$$\frac{21,470}{144} = 149, \text{ say, } 150 \text{ lb. per square inch,}$$

or less than half the permissible stress.

By making the plate of cast-iron of suitable thickness the bevelled bosses would contribute largely to its rigidity, and by forming a projection notched into the tie-beam, as shown in Fig. 157, a bearing 6 in. wide by 1 in. deep could be obtained against the end grain of the timber—thus making it impossible for the plate to slip forward.

WESTMINSTER CITY COUNCIL.

AT the fortnightly meeting of the Westminster City Council on Thursday last week the following matters were dealt with:—

Widening of Wardour-street.—The Improvements Committee reported that, in connexion with the widening of Wardour-street, a claim had been received from Miss E. Joseph for 2,276*l.*, and value of interest in land taken and damage to remainder. The Committee were advised that the claim was excessive, and recommended that a formal offer be made to Miss Joseph, and in default the necessary steps prescribed by statute to empanel a jury to assess the compensation be forthwith taken.—Agreed.

Marble Arch.—It was reported that Mr. F. W. Speaight had forwarded a framed "Bird's-eye view" of the contemplated improvement at Marble Arch, and asked that the picture might be exhibited in a prominent place at the City Hall. The sketch illustrates Mr. Speaight's original proposal, and would of necessity be somewhat modified if either of his other plans, or the further modification he understood the London County Council had suggested, were adopted instead.—The picture was ordered to be hung in Committee Room No. 1.

Combined Drainage.—The Works Committee reported having made an order approving the drainage by a combined operation of the buildings in course of erection for the Ecclesiastical Commissioners in Chapter-street and Frederick-street with an outlet to the sewer in Frederick-street. The same Committee reported having received amended plans for the drainage of the *Morning Post* offices, and of a proposed 9-in. drain in Wellington-street and Savoy-street to connect the drainage with the sewer in Savoy-street. It was agreed to allow the plans on condition that the work was carried out by the City Council at the expense of the applicants, and that when completed the drain should be handed over to the City Council and vested in them as a sewer within the meaning of the Metropolitan Management Act, 1855.

INCORPORATED CHURCH BUILDING SOCIETY.

THIS Society held its usual monthly meeting, being the first of the present session, on Thursday, the 15th inst., at 7, Dean's-yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.: Building new churches at Aldershot, St. Augustine, Hants, 100*l.* for the first portion; Bedminster, St. Aldhelm, near Bristol, 55*l.* for the first portion; Crofton Park, St. Hilda, Kent, 300*l.* in lieu of a former grant of 175*l.*; New Brompton, St. Luke, Kent, 150*l.*; West Bromwich, The Good Shepherd, Staffs, 60*l.*; and Wolverhampton, St. Chad, Staffs, 70*l.* for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Chesterton, St. Michael and All Angels, near Peterborough, 15*l.*; Knaresdale Parish Church, Northumberland, 5*l.*, making in all 30*l.*; Lyons, St. Michael and All Angels, Co. Durham, 10*l.*; West Thurrock, St. Clement, Essex, 40*l.*; Whaplode Drove, St. John-the-Baptist, Lincs., 30*l.*; and Woodham, All Saints, near Woking, 50*l.* Grants were also made from the special Mission Buildings Fund towards building mission churches at Brithdir, near Bargoed, Glam., 40*l.*; Cleeve Hill, St. Peter, near Cheltenham, 25*l.*; Felling, St. Oswald, Co. Durham, 30*l.*; Selhurst, St. Barnabas, Surrey, 20*l.*, and Warley Woods, near Birmingham, 40*l.*; and towards adapting an existing building as a mission church at Thornton-le-Clay, near Flaxton, Yorks, 10*l.* The following grants were also paid for works completed:—Hednesford, St. Peter, Staffs, 60*l.*; Buncton, All Saints, Sussex, 15*l.*; Kilmington, St. Mary, Somerset, 10*l.*; Monewden, St. Mary, Norfolk, 30*l.*; Cleeve Prior, St. Andrew, near Evesham, 30*l.*; Peatling Magna, All Saints, near Lutterworth, Leics., 25*l.*; Compton, St. Mary and St. Nicholas, near Newbury, Berks, 25*l.*; Borough Green, The Good Shepherd, near Wrotham, Kent, 75*l.*; Forton, St. John, Hants, 100*l.*, making in all 250*l.*; Smethwick, St. Alban, Staffs, 150*l.*; Brixworth, All Saints, near Northampton, 20*l.*; Waltham Cross, St. George, Middlesex, 500*l.*, making in all 1,000*l.*; Stretford, All Saints, near Manchester, 60*l.*; Netherton, All Souls, Cumberland, 140*l.*; New Cleethorpes, St. Aidan, near Grimsby, 125*l.*; Bottisham, Holy Trinity, near Cambridge, 35*l.* on account of a grant of 45*l.*; Field Dalling, St. Andrew, Norfolk, 10*l.* on account of a grant of 30*l.*; Hereford, Holy Trinity, 70*l.*; Bournbrook, St. Wulstan, near Birmingham, 250*l.*; Little Ilford, St. Michael and All Angels, Essex, 120*l.*; Mortlake, St. Mary, Surrey, 150*l.*; Egg Buckland, St. Erasmus, Devon, 20*l.*; South Bermondsey, St. Mary, Surrey, 50*l.*; Cwmffrwddoer, All Saints, Mon., 35*l.*; Camelsdale, St. Paul, Sussex, 20*l.*; Woolwich, St. Martin, Kent, 25*l.*; Newport, St. Barnabas, Mon., 50*l.*; and Hellifield, St. Aidan, near Long Preston, Yorks, 50*l.* In addition to this the sum of 500*l.* was paid towards the repairs of twenty-four churches from trust funds held by the Society.

The following resolution was unanimously adopted at this meeting:—

"Resolved that the Committee of the Incorporated Church Building Society, having heard with deep regret of the death of John Thomas Micklethwaite, Esq., F.S.A., for sixteen years a member of the Committee of Honorary Consulting Architects and latterly its President, desire to record their sense of the great loss they and the Church at large have sustained by his death, and to bear testimony to the very careful and thorough way in which he rendered most valuable service to the society, and they further desire to express their sympathy with the relatives of the deceased gentleman, who was so universally respected by all who knew him."

Obituary.

MR. CHARLES LOCKE EASTLAKE.—Many of our older readers will hear with personal regret of the death of Mr. C. L. Eastlake, who during the twelve years (from 1866 to 1878) that he filled the post of Secretary of the Institute of Architects, was known personally or by correspondence to a great proportion of the members of the architectural profession, with whom his courtesy and refined manners made him generally popular. Mr. Eastlake intended to practice as an architect, and received his architectural education in the office of Hardwick. He won a medal at the Royal Academy subsequently, and spent a good deal of time in sketching abroad, but as far as we are aware he never really entered into practice as an architect, or carried out any building. When the Council of the Institute of Architects decided that the secretarial work had become so large a business that they could no longer depend on voluntary effort for carrying it on, but must have a salaried Secretary to devote his time to it, Eastlake easily distanced all the other candidates and was appointed with general approval. The Secretary's work at that time was nothing like what it is now, and it was perhaps comparatively an easy post, but at all events he filled it to everyone's satisfaction. In 1878 he was given the post of Keeper and Secretary of the National Gallery, an appointment to which his name and his family connexion with a former director (he was the nephew of Sir Charles Eastlake) no doubt helped him, but for the duties of which he was we believe eminently fitted; he had a great knowledge of and interest in pictures, as well as habits of method and arrangement; and in our opinion the post of Director of the Gallery, which he had much coveted, might very well have been conferred upon him. As it was, he retired from the Keeper-ship after holding it for twenty years. His book, "Hints on Household Taste," published many years ago, had a considerable effect in preparing the way for the improvement in furniture design and applied art in which Morris was the principal influence, and in America it became almost a household word, and a house furnished in improved taste was said to be "Eastlaked." Mr. Eastlake had a general interest in literature, outside of the field of art, and not long since he contributed an admirable article on Thackeray to the *Nineteenth Century*.

INFANTS' SCHOOL, CADLE.—On the 16th inst. Sir John Llewelyn opened at Cadle, near Swansea, a new infants' school, which has been erected by the County Education Authority at a cost of 2,800*l.* The school contains a central hall and three classrooms, and was built by Messrs. Walters & John, from designs of Mr. Nash, and provides accommodation for 120 children.

General Building News.

ROMAN CATHOLIC CHURCH, NENAGH.—The Church of St. Mary's of the Rosary, at Nenagh, was recently consecrated by the Rev. Dr. Fogarty, Bishop of Killaloe. The ground plan of the church is cruciform, and comprises the nave, 29 ft. wide in the clear, aisles, two transepts, tower, baptistery, deep chancel, two side chapels, and sacristies. The nave consists of five bays of pointed arches, heavily moulded, and all carried out in Portland stone. To these five bays succeed the transept arches. The shafts supporting the arches are of warm cream-coloured stone, quatrefoil in section, with capitals and bases moulded to correspond. The roof is open, timbered to the ridge, every principal supported on wall shafts and corbels of stone and polished marble. The capitals of the nave arcade and the bosses of the arches have been carved by Mr. J. A. O'Connell, of Cork. The transepts are lighted by three-light windows, and contain recesses for confessionals. The chancel is divided from the nave by a tall and recessed chancel arch, all in Portland stone, the drop arch, carried on Irish marble shafts. The baptistery has two two-light tracery windows, is richly tiled to correspond with the chancel, and is covered with a timber-groined roof, supported on marble shafts. The wrought-iron work throughout the church is the work of Mr. John Fagan, of Dublin, who was also responsible for the system of lightning conductors. The floors throughout are of solid concrete covered with selected wood blocks, laid on Mr. J. Duffy's patent interlocking system. The sacristies, which lie to the north of the chancel and Lady Chapel, are divided into two for priests and for boys by means of folding doors. The church is nearly 200 ft. in length, while the width across nave and aisles is over 60 ft. The heating is on the combined hot-air and hot-water system, by Messrs. Musgrave & Co., Belfast. The bell, of about 45 cwt., is by Mr. Mathew Byrne, bell-founder. The tower, which contains the bell, is surmounted by a spire rising to an altitude of nearly 200 ft. The external walling is of a blue limestone procured in the neighbourhood, relieved with cut-stone dressings of a white limestone. The roofs are covered with Killaloe slates, and Messrs. Cooper's Drinagh cement, from Wexford, was used for the cement work throughout. The contractors for the whole of the general works were Messrs. John Sisk & Sons, Cork, their tender amounting to 24,000*l.*; and the architect, the late Mr. W. G. Doolin, M.A. (Doolin, Butler, & Donnelly), of Dublin, whose designs were accepted in open competition.

NEW CHURCH, SLOUGH.—St. Paul's Church, which has been erected in the Stoke-road, Slough, was recently consecrated by the Bishop of Oxford. The building consists of a chancel with a semi-octagonal apsidal end, lighted by a range of clearstory windows round three sides. On the south side the chancel opens, through three arches, into the morning chapel, which has a semi-dodecagon apsidal end. On the north side the chancel opens into the organ chamber through two arches, corresponding to those opening into the chancel on the south side. North and east of the organ chamber are the choir and clergy vestries. The nave is 86 ft. in length by 25 ft. wide, and 56 ft. high to the roof ridge. It opens into the north and south aisles through a range of six arches on either side and into the narthex at the west end through three arches, which support the west wall and gable. The nave is lighted by a clearstory of lancet windows in triplets on the north and south aisles and through two windows in the west. The aisles are 87 ft. long by 11 ft. wide, lighted by lancet windows in couples. The main entrance porches are planned in the corners, at the west end, formed by the aisles and narthex, and the main doors open into the narthex, with subsidiary doors into the west end of aisles. One of the features of the west end is the semi-circular baptistry, opening externally. The extreme length of the church is 154 ft., and the width 14 ft., the height to the top of the bell-gamble being 78 ft. The building is faced with Messrs. Nash's best red bricks externally and internally, except such wall space as is coloured, and these are finished with cement. The stone work generally is Monks Park Bath, the columns being worked in the weather bed Ancaster stone. The roofs are covered with dark red Broseley tiles, whilst the roofs are boarded, the whole in the main roofs, which is visible, being in wrought firs. The seats are of Canadian oak, and accommodation is provided for 684 adults. The cost exceeds 10,000*l.* Messrs. Cutts, of London, are the architects, and the contractor is Mr. H. Flint, of High Wycombe.

SUNDAY SCHOOL, MOUNTPOTTINGER, BELFAST.—New Sunday School premises have been erected in connexion with the Mountpottinger Unitarian Church. The work has been executed in Scrabo stone, rough-dressed. The contract was entrusted to Mr. Hutchinson Keith, who acted on the plans of Messrs. Young & M'Kenzie. Messrs. Davidson, of the Sirocco Works, installed the heating apparatus.

CHERWELL HALL TRAINING COLLEGE AND MILHAM FORD SECONDARY SCHOOL, OXFORD.—The opening of the new wing at Cherwell Hall and the new Milham Ford school takes place this Saturday. The opening ceremony will be performed by the President of the Board of Education. The Cherwell Hall extension, which has been executed with local white bricks, with Bath-stone dressings and Broseley tile roof, contains on the ground floor, entrance-hall, and staircase, eight study bedrooms, cloakroom and lavatory, bath-rooms and water-closets; on the first floor, common room, 25 ft. by 18½ ft., and seven study bedrooms, bathrooms and closets; on the second floor, ten study bedrooms, bathrooms and closets; the corridors are airy and well-lighted. Access to the old building is given on each floor by corridors. Each study bedroom is provided with fresh and foul air-ventilators and heated by radiators, and fitted with electric reading-lamps. Cherwell Hall has now accommodation for fifty students. Milham Ford, with the exception of the caretaker's portion, has been entirely rebuilt, and executed with red facing bricks and Bath-stone dressings, with stone mullioned windows and slate roof. This school contains on the ground floor entrance-hall and staircase, three classrooms giving accommodation for eighty-four scholars, science room for thirty, common room, cloakroom, lavatories and latrines. On the first floor the accommodation comprises two class-rooms giving accommodation for fifty-six scholars, studio for fourteen, lecture-room for thirty, lavatories for teachers, and bedroom accommodation for caretaker and two teachers. The whole of the heating has been carried out on the low-pressure hot-water system, by means of radiators at Cherwell Hall and pipes at Milham Ford, by Messrs. Bacon & Curtis, of Bourne-mouth, who have also executed the electric lighting at both schools. The locks and fittings were supplied by Mr. James Gibbons, of Wolver-hampton. Both buildings were executed by Messrs. T. H. Kingerlee & Son, contractors, Oxford, from plans by Mr. Walter Andrew, architect, Parkstone.

CHURCH HOUSE, ST. CLEMENT'S PARISH, HASTINGS.—On Tuesday last the Bishop of Chichester opened the new Church House, which has been erected from the design and under the superintendence of Messrs. Cooper & Coussens, architects, of Hastings. The building consists of a basement and a ground floor, the former with two good classrooms, divided by a movable partition; a kitchen and suitable lavatories and stores, and the latter with one room about 52 ft. by 25 ft., which is connected with the basement by two staircases and by a service lift from the kitchen. There is also a separate entrance to the basement. Externally the building is faced with red bricks, and is covered with a green slate roof, and internally the walls are finished with a boarded dado and plaster above. The floors are of pitch-pine wood-blocks on concrete. The work has been carried out by Mr. W. F. Ditch, builder, of Hastings, at a cost of about 1,570*l.*

GENERAL POST OFFICE, NEWGATE-STREET.—The plans and designs for the new buildings on the site of the Bluecoat School have been prepared by Sir Henry Tanner, of H.M.'s Office of Works. It is stated that they will be constructed on the Hennebique system of ferro-concrete.

PROPOSED NEW WORKHOUSE, HOMERTON.—The City Guardians have decided not to invite competition for the new amalgamated workhouse and infirmary to be erected on one site at Homerton. The special committee appointed to consider the whole question reported that, after several consultations with Local Government Board officials, it had been agreed to erect, not an entirely new building, but to let part of the existing building at Homerton remain, and to add to and alter it, so as to make a complete scheme for the two institutions. The accommodation would be for 276 infirmary cases, thirty-two lunatics, twelve married couples, four isolation cases, and 336 workhouse inmates, making a total of 660. The committee recommended, "That, in view of the opinion expressed by the architect to the Local Government Board, they be empowered to negotiate with the architect, Mr. A. E. Pridmore, for his employment by them to prepare the final scheme and plans upon which tenders can be invited, and the work carried out subject to the approval of the guardians and the Local Government Board." In moving the adoption of the report, Mr. J. B. Wild stated that by not shutting up an entirely new building a saving of something like 50,000*l.* would be effected, the original estimate being reduced from 140,000*l.* to between 80,000*l.* and 90,000*l.* Mr. Brook Kitchin, architect to the Local Government Board, when questioned by a member who was in favour of inviting architects to submit competitive designs, declared that it was a great mistake in such matters to invite competition when they already had the services of a capable architect. This was the reason why the committee proposed to consult Mr. Pridmore at once. Mr. A. Monckton moved as an amendment that six architects be asked to submit designs, but after considerable discussion the amendment was lost, and the report of the committee adopted.

FEVER HOSPITAL, PERTH.—The new Fever Hospital, which has been built at a cost of between 11,000*l.* and 12,000*l.* by the Perth Town Council, is situated at Friarton, about a mile and a quarter to the south of the city. The adminis-trative block is placed in the centre of the site, having the scarlet fever pavilion on the east and the diphtheria and typhoid pavilion on the west. The laundry block is placed on the low ground to the west, while the lodge is at the entrance gateway, which is about 170 ft. from the Edinburgh-road. The ward pavilions are 120 ft. apart, and the number of beds provided for are thiry-six. In addition to the above there is a temporary hospital capable of accommodating eight or ten patients, and which it is proposed to utilise for convalescent scarlet fever patients previous to their discharge from hospital. The scarlet fever pavilion has one ward of twelve beds, and one of eight, with two observation wards of one bed each. The diphtheria, typhoid, and separation pavilions has six wards, divided into two wards of four beds each for diphtheria, two wards of two beds each for typhoid, and two wards of one bed each for separation. The accommodation provided in the administrative block is one for matron, ten nurses, and four domestic servants, cleaners, and cook, with a private room, dispensary, and lavatory for the non-resident physician. On the ground floor are the matron's parlour and bedroom, nurses' dining-room, doctor's-room, with dispensary and store-room; while the kitchen is placed at the back. A corridor runs outside, and communicates with the kitchen by the window, through which the food is passed. On the first floor there are two double-bedded rooms, and two single-bedded rooms, with bath and lavatory accommodation, the servants' quarters being on the second floor. The buildings generally, including the wards, are heated by open fires. Natural ventilation is relied on throughout in the wards by means of windows with hopper fanlights in upper parts, inlet flues at floor level at each bed and outlet flues at intervals at the ceiling level. In each duty-room hot water is supplied by means of a steam coil supplied by the steam boiler at the laundry, and when this is not available by means of a boiler at the back of the range in the duty-room. A water tank, holding about 1,800 gallons, has been provided in the attic floor of the administrative block, while there is a supplementary tank near the convalescent wards. The entrance lobbies and sanitary annexes are tiled, and the floors are laid with marble terrazza. The decoration of the wards is in "Satinette" enamel in pale shades of colour, the ceilings being ivory white. The laundry is fitted up with washing machine hydro-extractor, steam drying horses, and steam mangle. There is a steam disinfector of a new type, with an independent generator. The hospital was designed and has been built under the supervision of Mr. G. P. K. Young, architect, Perth. Mr. Alex. Beveridge was clerk of works, and the contractors were: Mason and brick work, Messrs. J. J. & P. M'Lauchlan, Larbert; joiner work, Mr. Robert Hill, Perth; plumber work, Messrs. Watson & Sons, Perth; plaster work, Mr. Alex. Patterson, Arbroath; slater work, Mr. A. Drysdale, Perth; glazier work, Messrs. G. R. Douglas, Perth; painter work, Messrs. George Muirhead & Sons, Perth; bells and telephones, Messrs. A. Westwood & Sons, Perth; laundry fittings, Messrs. D. & J. Tullis, Clydebank; sanitary fittings, Messrs. Doulton & Co., Ltd., Lambeth, London; ironmongery, Messrs. Garvie & Syme, Perth; grates and ranges, Messrs. Lindsay & Fenwick, Perth; wrought iron gates, etc., Messrs. J. Milne & Sons, Ltd., Perth; blinds, Messrs. J. A. & D. Cameron, Perth; laying-out of grounds, Messrs. D. & R. Taylor, Perth.

Sanitary and Engineering News.

IRVINE DISTRICT WATER BOARD, N.B.—The new reservoir which has just been completed at Caaf to supplement the reservoir at Munnoch was constructed by Messrs. James Young, Ltd., of Glasgow, at a cost of 40,000*l.* The water area extends over 37 acres, with a maximum depth of 67 ft., and the reservoir when quite full will hold 190 million gallons.

WHARF, ETC., ELSWICK.—Messrs. J. Howe & Co., of West Hartlepool, have nearly completed a wharf, measuring about 500 ft. by 50 ft., at Elswick-on-Tyne, for an extension of the ordnance works of Sir W. G. Armstrong, Whit-worth, & Co.; and a new berth for armour-clad ships is being added to the shipyard. The berth, 650 ft. long, has a platform of ferro-concrete (Hennebique patents), sustained by some 600 piles of that material, which is also used for

the piles of the wharf and of the foundations of the travelling cranes. The contract provides for a normal superload of 6 cwt. per square foot on the decking of the wharf. Messrs. Purdie & Thompson, of Newcastle, are the contractors for the shipyard berth.

BRADFORD SEWAGE DISPOSAL.—A meeting of the Bradford Sewage Committee was held on the 20th inst., at the Town Hall, Mr. E. J. Smith presiding. The special business of the meeting was to consider the scheme drawn up by Mr. J. Garfield, the City Sewage Engineer, for the sewage disposal works at Esholt. The scheme, as outlined in the report, is estimated to cost about a million sterling, independent of the land which has been acquired. Mr. Garfield makes detailed suggestions as to the situation and construction of the disposal works at Esholt, of the buildings which he considers necessary, and also as to the situation and construction of the great tunnel which will require to be constructed through Wrose Hill. After discussing the project at some length the committee decided to hold another meeting at Esholt, at which a resolution for the adoption of the scheme by the committee will be submitted by the chairman.

MARKET HARBOROUGH WATER SUPPLY.—Mr. H. G. Coales, Surveyor to the Market Harborough Urban District Council, has submitted to the Local Government Board for approval a report on the present and proposed additional water supply of Market Harborough.

Appointments.

COMMITTEE OF INQUIRY INTO DANGERS IN BUILDING OPERATIONS.—The Home Secretary has appointed Mr. G. Macfarlane, President of the National Federation of Building Trade Employers, and Mr. Dennis Hoggerty, general secretary of the United Builders' Labourers Union, to be additional members of the Committee of Inquiry into the Dangers attendant on Building Operations.

LIVERPOOL.—Pending the approval of the proposed building scheme, plans and specifications of the proposed offices to be erected by the Royal Liver Friendly Society on the northern portion of the George's Dock site, are being prepared by Mr. Aubrey Thomas, Dale-street, Liverpool, who has been appointed architect of the building. Messrs. Richard Holt and Henry L. Goldsmith, of Victoria-street, and Dale-street, have been appointed as quantity surveyors. It is anticipated that some of the leading steamship lines will take suites of offices in the new building, and applications with this object have already been received from local firms.—*Liverpool Post.*

Foreign.

GERMANY.—Castle Richmond, Brunswick, was built for the Duchess Augusta, sister of George III., of England, in 1763, at a cost of 190,000 thalers. Unfortunately the building was pulled down in the seventies when the authorities decided to restore the fortress of Dankwardrode, within whose walls the castle had been built. This is the more to be regretted in that it was the *chef d'œuvre* of Karl Christoph Fleischer, a prolific XVIIIth century architect, who, like Christopher Wren, was mathematician, engineer, and architect. The versatility of this man is remarkable, but his architectural works are characterised by a thorough and scientific spirit rather than by conspicuous artistic merit, with the single exception of Scholss Richmond, now only preserved to us in carefully-measured drawings.——A public school for 250 pupils has lately been opened in Worms. The buildings are rough-cast and their steep slate roofs and numerous gables give them the stamp of Rhenish Late Renaissance architecture. The designs were prepared in the grand ducal municipal offices, under the direction of Messrs. Hofman & Klingelhöffer. The cost amounted to 560,000 marks.——On October 25 were opened the new theatre and the Mozart Concert Hall in Nollendorf Platz, Berlin. The buildings, which form one design, are the work of Messrs. Boswan & Knauer. The concert hall can seat 1,600 persons, while the theatre, which has the largest revolving stage in Germany, can accommodate 1,200 spectators.——In the competition for designs for a colonnade to be built in Carlsbad, the first prize of 8,000 k. was won by Herr Franz Josef Weiz, of Posen. Out of fifty competitors, only six advocated the removal of the old city tower, and ten the removal of the old colonnade.——Professor Gabriel von Seidl, of Munich, has won the first prize of 15,000 m., in the competition for a German museum to be built in Munich.——On August 16, 1901, the Government Offices in Coblenz were burnt down. The buildings had been erected early in the XVIIIth century as a monastery and an orphanage, and had since been used during fifty-eight years for Government purposes. The new offices are a free rendering of Romanesque, and the designs were prepared in the Public Works Department under the direction of the late Herr Kieschke. The cost amounted to 2,110,450 marks.——A short while since the memorial fountain to Goethe was unveiled in Franzensbad. It is the work of the sculptor, Karl Wilfert, jun., of Eger, who to the simplest architectural outlines has added a happy combination in colours resulting from yellow granite, white marble, and bronze. The central feature is a heroic-sized head of the poet, beneath which spout two water-jets, the one the Source of Beauty, as is indicated by the marble figure of a maiden, over life-size, gazing at her own reflection in the water basin at her feet, and the other jet, the Source of Truth, symbolised by the figure of a youth drinking from an antique bowl, supposed to be filled at the Well of Truth. On either side of the figures two marble reliefs are let in to the granite; the one representing Drama, and the other Lyric poetry.

AUSTRIA.—The new School of Commerce, Innsbruck, shows an important advance in the designing of school buildings. Its irregular, picturesque outline is the outcome of a plan which exactly carries out the required conditions. It is the work of Eduard Klingler, of Innsbruck, and cost 550,000 kronen.——Just as Brunn was the first Continental town to light its theatre with electricity, so it is among the first to make use of a refuse destructor. The mountains of refuse formerly surrounding the town are now converted into marketable matter, gas, clinker, and ash. Contractors will shortly be compelled to use the two latter products on all large municipal buildings, in concrete and mortar, as well as on the construction of roads, so that the demand will in all probability exceed the supply from the furnaces.——On October 30 the monument to Rafael Donner, by Richard Kauffungen, was unveiled. It is one of the finest monuments erected in recent times in Vienna. The sculptor is portrayed, over life-size, in his working-dress on a vast red granite pedestal. On a stand at his side is a small model of the principal figure on Donner's fountain in the Neu Markt, Vienna.——In a railway tunnel it was discovered that the concrete vault was yielding to the influence of sulphuric acid given off by the gases in smoke. By washing the vault with preolite the destructive effect of the acid was checked.

BULGARIA.—An international competition is announced for Law Courts to be built in Sophia. Designs to be sent in from January 15-28, 1907, inclusive. Four premiums are offered; the first premium being of 5,000 francs. Conditions and particulars to be obtained gratis from the "Ministère de l'Instruction Publique," Sofia.

INDIA.—The Public Works Department state in their annual review of irrigation for 1904-5, that in a total area of more than 20,000,000 acres under irrigation, the estimated value of crops raised by means of works for which capital accounts are kept exceeds 41 crores of rupees (27,333,333*l.*), or 87 per cent. of the capital outlay, and that the net revenue, 7·60 per cent., on "productive" works is the highest yet recorded. The rates, which are affected by natural causes, vary from 0·23 per cent. for Burma to 14·17 per cent. in the Punjaub, and 22·82 per cent. for the Eastern Jumna Canal. A large proportion of the centrifugal pumps with oil engines for their working is furnished by Messrs. Ruston, Proctor & Co., of Lincoln.——As part of the Central Provinces' memorial to the late Queen and Empress a statue, life-sized, sculptured in white marble, by Mr. Hubert Hampton, has been unveiled at Nagpore by Sir Andrew Fraser, late Chief Commissioner, and now Lieutenant-Governor of Bengal. The memorial scheme comprises a Victoria Technical Institute for the cultivation of scientifical and technical studies, and the promotion and improvement of agricultural and other industries.

EGYPT.—It is anticipated that by the end of next year will be completed the dredging of the new entrance to the port of Alexandria, to a width of 600 ft. and a low-water depth of 35 ft. In the careening basin the wooden jetties are being replaced with quays of stone, a system of drainage for the quays is planned, new shipberths and storage-magazines are provided; the entire scheme for enlarging and improving the port, for traffic in cattle, coal, and general commodities, for protecting the outer harbour, and for the new pass through the reefs, will be finished in the course of three years.

AUSTRALIA.—Messrs. J. M. & H. E. Coane, of Melbourne, engineers, and Mr. G. Kilburn Scott, Professor of Electrical Engineering, Sydney University, have jointly drawn up tables of figures relating to the costs and working expenses of a revived proposal to use the head waters of the river Goulburn, Victoria, in the generation of electricity, with a power-station at Trawool. The undertakers will, they expect, be able to supply Melbourne (where the price now charged is 2d. per unit), Bendigo, and Ballarat, at a price of about ¾d. per unit, with energy sufficient for the whole requirements of Melbourne, and for nearly all the mines of the two other named towns. The scheme extends to the provision of large irrigation works.

ECUADOR.—Mr. Consul Alfred Cartwright, reporting on the trade and commerce of Ecuador, South America, points out that during the last seven years Guayaquil, the largest town and chief port in the Republic, has passed through a state of transition, recovering from many severe disasters, which commenced with the two conflagrations in 1896, followed, before the city had yet recovered from these, by three conflagrations in 1899, 1901, and 1902, which latter disasters caused losses amounting in the aggregate to 950,000*l.* The fires of 1896 had destroyed the northern part of the city, including the four banks, the artillery barracks, the custom-house, the Girls' Conventual College, five of the principal churches, and in value more than two-thirds of the whole city. Of these buildings the churches of San Francisco, the Merced, San Augustine, Concepcion, and Parroquia have been rebuilt. The four banks have erected buildings for their own service on their own lands. The custom-house has been reconstructed, although only in the commonest and cheapest form of cane buildings, yet sufficient for the storage of all the imports to Guayaquil. About one-half to two-thirds of the house property destroyed in these and subsequent fires has been rebuilt, with wide streets and better precautions against fire risk, so that the city has resumed its ordinary businesslike appearance. The municipality, after the costly experiences of 1902, insisted on all streets in the burned districts being widened to nearly 100 ft., or no house being built over two stories high (ground-floor and one upper story), and on the absolute prohibition of pitch-pine in the construction. These regulations have been strictly adhered to. The aspect of the city, as rebuilt, is considerably improved. Many fresh charitable institutions have been built, including two fine hospitals, one of which cost 6,500*l.* and the other 32,500*l.* to erect; the average yearly expenditure on both establishments is about 8,000*l.*, provided as to 80 per cent. by the municipality and as to 20 per cent. by the Government. The Government has also rebuilt, at a heavy cost, the San Vicente College (now styled the Collegio San Vicente). Regret is expressed that the reconstruction of the city has been restricted to the old districts, thus concentrating all the buildings on the low lands in the vicinity of the river and the savannah, extending towards the Estero Salado (or Salt Creek). It would have been far healthier and better to have left the centre exclusively for business establishments and to have built the residences or private houses on the various hills to the north and west of the city. An American syndicate connected with the railway company has bought the extensive estate known as the Recreo, on the other side of the river from Guayaquil, and proposes to establish there a new residential city, together with docks for the discharge and shipment of cargo for and from the interior.

CENTRAL AFRICA.—The construction is begun of a railway which, starting from Lobito Bay on the west coast, will traverse Portuguese South-West Africa to effect a junction with the Cape to Cairo line at Katanga at a point south of Lake Tanganyika. Lobito Bay is distant a week's sailing from the Cape, and the liners could stop there for passengers and cargoes. Native labour is largely employed in the laying of the new line, the rate of advance being about 1 mile per diem, and it is anticipated that the work will be completed within the contract time of three years, as 1,000 miles are already laid down. The land-locked bay at Lobito has a water area of about 15 square miles, lying behind a level tongue of sand, from 3 to 4 miles wide, cast up by the action of the sea; the inner waters are deep enough to enable an ocean liner to approach at low tide closely to the sandy shore, which has a precipitous gradient rate.

SOUTH AFRICA.—Only four or five buildings of any note are now under construction in the Cape Peninsula, and it is stated that fewer artizans are engaged than has been the case during any period in the last nine years. A notification of a general reduction of wages by 2d. per hour has been posted by the Master Builders' (Cape) Association, to take effect from November 30 in the case of masons, and from October 16 as regards plumbers, plasterers, bricklayers, carpenters and joiners.——During the period September 1 to 30 thirty-five plans were under consideration by the Cape Town City Council, of which seventeen have been approved, eight returned to the architects for amendment, three withdrawn and seven remain under consideration. The approximate cost of the proposed work is 11,045*l.*——Surface drainage works are still in progress at Woodstock and Salt River, also the paving of the Dock Road and construction of a reservoir at the Kloof Nek. A total of about 320 men are employed in all.——At Port Elizabeth the supply of labour is still considerably in excess of the demand in all branches of trade, and there is a tendency towards the reduction of wages. Only six buildings of any note are under construction, about 120 men being employed including coloured labourers. Work in connexion with the new waterworks scheme has been commenced.

Miscellaneous.

SKINNERS' COMPANY.—Mr. Frank Brangwyn, A.R.A., is engaged upon the decoration of the walls of this Company's Hall with a set of eleven panels, five of which are now finished. At a recent banquet in his honour the Speaker was presented with a silver casket, designed and executed by Mr. Nelson Dawson, to contain an illuminated copy of the resolution conferring the freedom of the Company upon Mr. Lowther. The casket is fashioned of hammered silver; it bears Mr. Lowther's and the Company's coat-arms at the ends, and a high relief model of the Speaker's mace upon the lid. The Hall was rebuilt many years ago, after the Italian style, by George Moore, F.R.S.

LILBOURN, NORTHANTS.—A fund of 800*l.* is opened for the reparation of the interior of the parish church of Lilbourn, near Rugby. The village lies on the Watling Street, and has been identified with the Roman Tripontium. The original establishment of the present XIIIth-XIVth century church of All Saints is ascribed to Robert de Mellent, Earl of Leicester, who bestowed it upon the collegiate church of St. Mary, which he refounded within the Castle, at Leicester, in or about 1107. The greater portion of the revenues of St. Mary-the-Less were, with All Saints, Lilbourn, transferred to the Abbey of St. Mary de Pratis, Leicester, which some forty years afterwards was founded by Robert le Bossu, Earl of Leicester, for Augustinian canons regular, and at the Suppression possessed a gross revenue of 1,062*l.* 0s. 4½d. per annum. Of All Saints the nave and south arcade lean over, and the tower is cracked on two sides.

THE VICTORIA AND ALBERT MUSEUM.—A committee of the Kensington Borough Council are to consider a letter from Messrs. Elsworth & Knighton calling attention to the block of houses opposite the Victoria and Albert Museum, pointing out that these mar to a considerable extent the appearance of the museum, and asking whether the Borough Council will be prepared to consider the advisability of purchasing, jointly with the London County Council, the Commissioners of the Exhibition of 1851, and His Majesty's Office of Works, the houses in question, demolishing the same, and levelling the site; or failing this, erecting buildings of low elevation on the ground.

ASSOCIATION OF TEACHERS IN TECHNICAL INSTITUTES.—The annual meeting of the Building section of the Teachers in Technical Institutions was held, on Saturday last, at the Regent-street Polytechnic. Mr. Charles F. Mitchell presided. The following officers were elected for the year:—Chairman, Mr. J. Fitzgerald (Brickwork: Paddington); Vice-Chairman, Mr. T. Hobart Pritchard, F.R.A.S. (Geometry, etc.: Regent-street); Secretary, Mr. J. Sandham (Building: Battersea); Committee, Messrs. Arnall, M.R.S.I. (Building: Wandsworth), Bates (Geometry and Brickwork: Chelsea), Borham (Masonry: Northern), Burlington (Masonry: Brixton), Cox (Carpentry: Regent-street), Davey (Carpentry: Wandsworth), Mitchell (Building: Regent-street), Channon (Plastering: Brixton). The next meeting of the Section will be held on Saturday, December 8, when a paper will be read by Mr. Arnall, M.R.S.I., on "Practical Sanitary Science" as a technological subject.

EDINBURGH MERCHANTS AND THE PRINCES-STREET TERRACE.—The seventy-sixth annual meeting of the Edinburgh Merchants' Association was held in Dowell's Rooms, George-street, on the 14th inst., Mr. A. Louis Reis presiding. Bailie Dobie was present and explained his scheme for the proposed widening of Princes-street, and repeated his arguments in favour of the proposal. His idea, he said, had not been to have his model adopted, but only to get people to think about the matter. He had invited the Architectural Association to inspect the model, and he had a reply to the effect that as a general principle the Council was of opinion that the widening of the south pavement of Princes-street would add to the beauty of the city and conduce to the comfort of those using the gardens and greatly improve the pavement as a promenade. The model however showed a treatment quite unsuited to the circumstances, and it would be infinitely better that nothing be done rather than that anything of the proportions, character of building, or design indicated by the model should be carried out. The Council at the same time considered it probable that a modification of the scheme would meet with approval, and they would be glad to give any help towards arriving at a more suitable modification of the scheme. The cost of the scheme was, said Bailie Dobie, estimated at 13,500*l.* A discussion took place, and most of the speakers expressed themselves against the proposal.

THE CAMPANILE OF ST. MARK.—Ever since the restoration of the Campanile at Venice has been going on doubts have been expressed as to the quality of the materials used in its reconstruction. The Syndic of Venice, Count Grimani, commissioned Professor Luxardo to make an examination of the bricks and mortar employed, and he reports that they both contain qualities which give no guarantee of their stability, and it is now proposed to level to the ground the work which has been already done, in order to begin again with more satisfactory materials.—*The Standard.*

PROPOSED MUNICIPAL ART SCHOOL IN EDINBURGH.—The Lord Provost's Committee of Edinburgh Town Council gave its general approval, on the 14th inst., of the report prepared on the subject of the proposed Municipal Art School. They agreed to appoint a deputation on the subject to the Secretary for Scotland to press a claim for a satisfactory grant from the funds in the hands of the Scottish Education Department towards the new institution. The promised grant was contingent on the provision of a satisfactory sum towards the erection of such a building. It will be pointed out by the deputation that the estimated cost of the school is 50,000*l.*, and that the site of the old Cattle Market provided by the city is equal to at least 15,000*l.* It is hoped that in connexion with the building a grant may also be obtained from the Board of Manufacturers.

GLASGOW CITY IMPROVEMENT.—Mr. W. C. Menzies, manager of the Glasgow City Improvement Department, has issued notes on the operations of the Department. It states that the revenue for the year ended in May, 1906, was 33,413*l.*, against 28,271*l.* for the previous year. The number of houses erected by the Department during the twelve months was 159, the total number erected now being 2,124. Of these 570 are one-apartment houses, and sixteen are houses of larger accommodation. Three tenements of dwelling-houses for the poorest classes at Winning-row, Parkhead, consisting of thirty-six two-apartment houses are at present in course of erection or under consideration. The cost of these is estimated at 3,446*l.*

LIVERPOOL CATHEDRAL.—Two of the windows in the choir will constitute memorials, respectively, to Sir Thomas and Lady Earle, to be erected by members of their family, and the late W. E. Gladstone, at a cost which will be almost met by a balance in the hands of the committee for the erection of the Gladstone memorial in St. John's-gardens. The executive committee find that in terms of the late Mr. William Imrie's testamentary dispositions, a sum of 70,000*l.* will perhaps accrue to the cathedral building fund, but they do not expect that the money will be available for the works now undertaken, as some time will elapse before the sum can become payable into the fund in their hands.

THE "PULTO" DOOR-CLOSER.—We have received from Mr. S. W. Finch, the patentee, a model and description of a simple and inexpensive door-closer. It consists of a horizontal brass pulley fixed to the door-frame, round which is reeved a short chain attached to a hook on the door, and acted on by a spring which rolls up the chain with one turn round the pulley, and pulls the door to. Springs are a weak point in this kind of action, as they deteriorate by use; but the device is simple and inexpensive, and may be useful.

SELBY ABBEY RESTORATION.—The Executive Committee of the Selby Abbey restoration fund met for the first time in the sacristy of the ruined building on Saturday last, under the presidency of Lord Wenlock, who was appointed chairman of the committee. The committee took into consideration the work which should be first proceeded with, and an initial expenditure of 10,000*l.* was agreed upon. The architect, Mr. J. Oldrid Scott, spoke of the necessity of covering in the ruins. He was instructed to prepare plans for the external roofing of the nave, choir, and transept, and to obtain estimates for the work. Mr. Scott stated that the repairing of the columns and arches should be undertaken without delay, and it was agreed that under a schedule of prices this should be proceeded with. The Rev. Benjamin Hemsworth was thanked for the gift of stone from his quarry for the abbey restoration.

THE PLUMBERS' COMPANY.—The Lord Mayor was the chief guest at the annual meeting of the Plumbers' Company, held on the 16th inst., at the Haberdashers' Hall. The Master of the Company, replying to the toast of the Worshipful Company of Plumbers, referred specially to the ever-extending work of the Plumbers' Company, whose operations had extended to far cities of the Empire. Important changes have been introduced during the past year in consolidating and making more efficient the Company's system of education and registration. Nearly 2,000 new men had been admitted to the class examinations and the register. He, however, warned all whom it concerned against setting aside the teaching of use and experience. The word "change" did not always spell "reform." He referred to the great traditional craftsmanship of the past which had resulted from a proper system of apprenticeship, and strongly advocated its revival. He concluded with a high tribute to Sir Horace Plunkett's work in Ireland in the cause of the increase of industrial efficiency.

SCOTS GREYS MEMORIAL, EDINBURGH.—On the 16th inst. the memorial erected in Princes-street, Edinburgh, to the fallen heroes of the Royal Scots Greys was unveiled by the Earl of Rosebery. The memorial consists of a representation of a trooper and horse of the Greys set on a rocky pedestal. It is the work of Mr. Birnie Rhind, R.S.A.

BUILDERS' FOREMEN'S ASSOCIATION.—A smoking concert in aid of the Pension Fund of this excellent Association is to be given this evening (Saturday), at the Queen's Room, London Tavern, Fenchurch-street. We wish it every success. Mr. W. S. Shepherd will occupy the chair. Tickets (1s. each) can be obtained from the secretary, Mr. G. Thomson, Memorial Hall, E.C.

Capital and Labour.

CONDITION OF THE BUILDING TRADES.—Employment continued dull, and was worse than a month ago in nearly all branches. It was rather better on the whole than a year ago. Returns received from firms employing 71,552 workpeople at the end of October show a decline in the number employed of 3,028, or 4·1 per cent., compared with a month ago. The decrease in the number of workpeople employed amounted to 2,022, or 5·2 per cent., in the case of skilled workmen, and to 974, or 3·3 per cent., in the case of labourers. In London the decrease amounted to 5·7 per cent. with skilled, and 3·8 with unskilled workmen. The percentage of trade union carpenters and joiners unemployed at the end of October was 7·6, as compared with 5·9 a month ago, and 8·2 a year ago. With plumbers 8·0 per cent. were unemployed, as compared with 7·8 per cent. a month ago, and 12·0 per cent. a year ago. Employment with masons, plasterers, and painters was worse than a month ago, but there was a slight improvement in the case of bricklayers. Compared with a year ago some improvement was reported by bricklayers and plasterers, and some decline by painters.—*Labour Gazette.*

Legal.

POINT UNDER LONDON BUILDING ACT.

MR. BODKIN, on the 16th inst., applied *ex parte* to a Divisional Court of King's Bench, consisting of the Lord Chief Justice and Mr. Justice Darling, on behalf of the Palace Theatre Company, Limited, for a rule *nisi* directed to the magistrate at Marlborough-street to state a case.

It appeared that the company, who are the occupiers of the Palace Theatre, a few months ago put up in the front of the theatre an advertisement consisting of a wooden framework with plaster modelling, and which was attached to the building by nails driven between the brick courses. This advertisement was certified to be in certain parts between 14 in. and 22 in. in front of the building line. The company were summoned under sect. 22 of the London Building Act, 1894, for erecting the structure beyond the building line without the consent of the London County Council. The magistrate (Mr. Bodkin) decided that the erection was a structure within the meaning of the Act, and the company required the magistrate to state a case upon the question of law involved.

Their lordships granted the application.

PARTY WALL DISPUTE.

THE case of Ratcliff *v.* Crowther came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Mr. Justice Darling, last week, on the plaintiff's appeal from a decision of Deputy Judge Stansfield refusing a new trial in a dispute about a party wall.

Mr. Compston, for the appellant, said the ground of the application was that since the trial fresh evidence had been discovered which would be conclusive of the plaintiff's rights against whom judgment was given. The County Court judge did not dispute that fresh evidence had been discovered, but held that it was not in law evidence discovered since the trial, and he refused a new trial. The action was brought to recover 3*l.* 11s. as damage for the pulling down of a small portion of the plaintiff's wall. The defendant counterclaimed for 80*l.* for encroachment on his land and the rebuilding of the wall, and a mandatory injunction for its removal. The judgment was against the plaintiff on the claim and for a mandatory injunction on the counterclaim. There was this serious question, that the learned judge found that the plaintiff's plan upon his title-deed was a forgery, which he ordered to be impounded and forwarded to the public prosecutor with a view to a prosecution. The properties of the plaintiff and the defendant in 1896 belonged to a Mr. Lister, the defendant acquiring part of the property in 1905. The defendant took down a wall which the plaintiff

called upon him to reinstate, and the defendant not doing it, he did it himself and claimed this 3*l.* 11*s.* It was said that in rebuilding the position of the wall was moved, and that was what the dispute was about. The County Court judge stopped the case, declaring the plaintiff's plan to be a forgery, and gave judgment for the defendant. The plaintiff went to Wakefield and looked at the defendant's conveyance, and there found the land conveyed to him did not include the land on which the wall was.

Mr. Crawford, for the respondent, said the conveyance to the defendant was not in Court, but he submitted that there should be no new trial, because it was the fault of the plaintiff that the necessary evidence was not produced at the trial.

The Lord Chief Justice, in giving judgment, said he was clearly of opinion that there must be a new trial in this case. Evidence had been obtained which could not reasonably have been put before the County Court judge. The case was a curious one. The late Judge Cadman went so far as to order the plaintiff's deed to be impounded, meaning that his decision was against the plaintiff on the ground that the site of the wall was not his, but that the evidence had been manipulated to make it appear to be his. It was argued that that decision was given in absolute ignorance of the fact that the defendant's plan confirmed that of the plaintiff. The injunction was granted on the view that the erected wall was on the defendant's land, and therefore the defendant had a right to the injunction. Notice to produce his deed had been given to the defendant, and he did not know why it had not been produced. The costs of this appeal would be the plaintiff's in any event, but the costs of the first trial would abide the result of the second.

Mr. Justice Darling concurred, and the appeal was accordingly allowed and a new trial ordered.

CONTRACTOR'S CLAIM FOR INDEMNITY UNDER WORKMEN'S COMPENSATION ACT.

In the King's Bench Division, on the 17th inst., Mr. Justice Bigham, sitting without a jury, heard the case of Greenwood, Ltd., *v.* Hawkings, an action in which the plaintiffs sought a declaration that they were entitled to be indemnified by the defendant, a sub-contractor, under a building contract, for the damages and costs the plaintiffs had paid in the matter of an arbitration under the provisions of the Workmen's Compensation Act, 1897.

The claim for compensation under the Act arose out of an accident which occurred during building operations at the Guildhall Tavern, King-street, Cheapside, a man named Hatfull, in the employ of the defendant, being killed in the course of his employment. The plaintiff company were the principal contractors under the contract, the defendant being the sub-contractor for the stone-carving work. The dependents of the deceased man claimed compensation under the Act against the plaintiffs as the undertakers of the building operations, and they obtained an award of 200*l.*, and the plaintiffs, paying that sum and 57*l.* odd for costs, claimed to be indemnified these sums by the defendant.

Mr. Clavell Salter, K.C., on behalf of the plaintiffs, said that although defendant was not selected by his clients to do the stone-carving work under the contract, but by the architect, he was actually employed by the plaintiffs on the terms of a letter dated June 26, 1905, which stated in effect that the defendant should execute the carving as per his estimate and according to his letter to the plaintiffs of June 23, 1905. The letter also ran as follows :—"You agree in accepting this order to sign and send per return of post the enclosed accident indemnity required by our insurance company of all sub-contractors." The indemnity was in the following terms :—"In consideration of your employing me to do the carving at your works, 23, King-street, I hereby undertake to indemnify and hold you and any insurance company with whom you may be assured harmless from and against all claims under the Workmen's Compensation Act, 1897, which may be made or brought against you by, or to which you or such insurance company on your behalf may have to pay to, any person in my employ upon such works in respect to any accident or injuries happening or occasioned to him whilst so employed." Defendant did not answer the letter of June 26, and did not fill up the form enclosed, but he proceeded with the work, and he (counsel) contended that in the circumstances he must be taken to have assented to the terms of the letter of June 26.

Mr. Ruegg, K.C., on behalf of the defendant, on this point said the substantial answer to it was that his client was not employed by the plaintiff company at all, but by the architect. If the plaintiffs said that by not filling up the indemnity form the defendant became bound by its terms by proceeding with the work his contention was that the plaintiffs ought not to have allowed him to proceed with the work.

His lordship said the plaintiffs were the principal contractors of the whole of the work, and by their contract they had to employ the persons to do different parts of the work whom the architect might select. The architect (Mr. Collins) having selected the defendant to do the ornamental stone work communications began between the plaintiffs and the defendant, the object of which was in his opinion to bring the parties into contractural relations. Although the defendant had not signed the form in question he went on with the work, and in his opinion the work was executed upon the footing of the order given by the plaintiffs and the document which was enclosed for him to sign.

Mr. Clavell Salter said that, his lordship having so held, the plaintiffs had only to prove the fact of the award and that the plaintiffs had paid the sums in question under it.

Mr. Ruegg admitted the award and the payments under it.

Mr. Clavell Salter then said that the only remaining question was that of contributory negligence. The defence set up was that the accident was occasioned by the plaintiffs not adequately lighting and fencing the staircase where the accident happened.

His lordship, having heard evidence on this point held that the plaintiffs had not been negligent in not having a handrail at the place in question, as such a rail, he said, would have interfered with the work going on. He accordingly entered judgment for the plaintiffs for the amount claimed, with costs.

SUBSIDENCE OF HIGHWAY :

Action by Wednesbury Corporation.

A considered judgment was given in the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Cozens-Hardy and Farwell, on the 16th inst., in the case of the Mayor, etc., of Wednesbury *v.* The Lodge Holes Colliery Company (Ltd.), on the plaintiffs' appeal from a judgment of Mr. Justice Jelf. The plaintiffs claimed against the defendants for damage to a highway known as Dangerfield-lane caused by the defendants working of their mine. As the result of the working the road sank about 7 ft. below its original level for a distance of about 200 yds., whilst its surface was broken up. The only question was what was the proper measure of damages. The material facts appear sufficiently from the following judgments.

The Master of the Rolls said the action was brought by an authority in whom a highway was vested under sect. 149 of the Public Health Act, 1875, for damage against the defendant company for letting down the highway by their mining operations. It was admitted that there was a good cause of action for substantial damages, and the only question was as to the amount. The case was tried before Mr. Justice Jelf at Birmingham, and on further consideration in London. At the trial the parties agreed to take the case before the judge alone. The plaintiffs claimed a sum of 400*l.* as the expense which they had actually incurred in restoring the road as nearly as possible to its original level, with the necessary retaining walls and fences, and the judge had found, as indeed the defendants admitted, that on that hypothesis 400*l.* was a fair amount for the plaintiffs to recover. It was not suggested that the plaintiffs had acted otherwise than with perfect *bona fides*, and in accordance with the opinion of highly-skilled advisers in the course they adopted; but the defendants contended, and Mr. Justice Jelf adopted their contention, that the measure of damages was not what it would cost to restore the road nearly to its original level, and maintained that the highway could be made as commodious for the public as before for a sum less than 80*l.*, which they paid into Court. The learned judge held that, although the plaintiffs had a proprietary right in the road, it was confined to what was necessary to maintain the road as a highway, and it would seem that it did not embrace the right to claim for loss of amenities to the public or the cost of restoring them. He also held that the plaintiffs, in restoring the road, had no right to consider the probability of future subsidence, or to incur any expense in adjusting their gradients with a view to such a possibility, although subsidence continued during the execution of the repairs, and even reappeared after action brought. The learned judge therefore gave judgment for the defendants. The plaintiffs now appealed. It was clearly decided in the Court of Appeal that a highway authority in whom the sides of the road forming the approach to a bridge were not vested had the right to raise a road which had subsided through mining operations to its original level, and gave no right of action to frontagers, in whom the soil was vested, by so doing. The local authority were trustees for the public of all rights and amenities incident to their property, and were not bound to forego one jot of those rights in case of a wrong-doer, or to accept at his dictation anything different from that which they had heretofore held as such trustees for the public—still less where they were advised by competent persons that the thing substituted would not be a complete equivalent, and would involve the risk of large additional expense. In his opinion the rights of the plaintiffs in this case, so far from being less than those of a private owner, were at least as high, with this addition, that as trustees they had not the absolute right to renounce them that a private owner would have. If the standard of compensation for the wrong-doer in this case was the same as that given by the statute, it followed that the true measure of damages here was the cost of restoration, unless the authority were in a worse position than a private owner. For the reasons he had given he thought they were not, and he could see no reason why they should be bound to accept anything less than full compensation, though their remedy was one given by the common law and not by statute. Therefore, with the greatest respect to Mr. Justice Jelf, he thought his lordship had applied a wrong standard in measuring the damages, and his judgment must be reversed.

Lords Justices Cozens-Hardy and Farwell concurred, and the appeal was allowed, and judgment entered for the plaintiffs for 400*l.*, with costs here and below.

CASE UNDER THE METROPOLIS MANAGEMENT ACT.

Mr. Danckwerts, K.C., on the 20th inst., applied *ex parte* to the Court of Appeal, composed of the Master of the Rolls and Lords Justices Cozens-Hardy and Farwell, on behalf of a Mr. Ballard, by way of appeal from the refusal of a Divisional Court of King's Bench to grant a rule *nisi* for a prohibition. He said the matter arose in the following way :—Proceedings were initiated before Mr. Garratt, a Metropolitan police magistrate, to recover a sum of money alleged to be due from Mr. Ballard to the Wandsworth Borough Council for the cost of repairing a road, the proceedings being instituted under the provisions of the Metropolis Management Act, 1890. wording of the Act was extremely obscure, and the question was whether the money was to be recoverable in the High Court or the County Court, according to the amount, or whether it was possible to proceed before a Court of Summary Jurisdiction for the money. Mr. Garratt considered the question an extremely difficult one, and by way of solving the difficulty in order to raise the question he said he would rule that he had jurisdiction, and then leave the parties to go for a prohibition. Mr. Ballard's point was that the magistrate had no jurisdiction, and that the proper proceeding was in the County Court.

The learned counsel having referred to the material sections in the statutes bearing on the subject,

The Master of the Rolls remarked that Mr. Danckwerts had said enough to show there was an arguable point on the matter, and it was not worth while to discuss it further at that stage.

Their lordships accordingly granted the rule.

Patents of the Week.

APPLICATIONS PUBLISHED.*

22,811 of 1905.—A Curwood : *Means for Fastening Window Sashes.*

This relates to means for fastening window sashes in which the sash is mounted in a window frame in the ordinary manner, and has upon each side a groove cut into its edge and a rack covering the said groove. A bracket is secured to the frame opposite each sash by screws which pass through holes provided in the front plate of the bracket. A toothed wheel mounted revolubly within the bracket upon a pin engages with the teeth of the rack, for the purpose of locking the sash at any desired heigh, a slot being provided on one side at the top of the bracket, and a locking bar adapted to enter the slot and to pass between the teeth of the wheel is operated by means of a handle projecting through the window frame, and is made integral with the locking bar. The handle has a stem upon which is threaded a spiral spring, the said handle and stem being mounted in a bracket secured to the window frame by screws passing through holes in the front plate of the bracket. The locking bar falls by gravity assisted by the spring between the teeth of the toothed wheel, and thus locks the window. To release the sash the operator raises the handle which lifts the bar, and thus releases the wheel, allowing the sash to be raised and lowered as desired.

25,144 of 1905.—F. W. White and A. C. White : *Ash-discharging Devices for Kitchen Ranges, and Similar Stoves.*

This relates to an ash-discharging device for kitchen ranges and similar stoves, in which a plate is placed across the bottom of a recess or flue, said plate being hinged at one end or side and provided with a handle or lever by which it may be depressed to discharge the ashes

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

PATENTS.—*Continued on page 615.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competition, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxx.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Competition.

* NO DATE.—**Grimsby.**—CHURCH, ETC.—Competitive plans are invited for a Congregational church, school, and manse at corner of Hainton-avenue and Welholme-road, Grimsby, at an estimated cost of 8,200*l.* Three premiums of 25, 15, and 10 guineas respectively are offered for plans. Conditions of competition will be sent to applicants on payment of 2*l.* 2s. For further particulars apply Mr. E. L. Bridge, Hon. Secretary, Fish Docks, Grimsby.

Contracts.

BUILDING.

NOVEMBER 24.—**Dinsdale.**—PREMISES.—For new premises at Dinsdale for Darlington Co-operative Society. Names to the architects, Messrs. Kitching & Lee, 14, Blackwellgate, Darlington, on or before November 24, together with the trades required. Bills of quantities will be supplied. Sealed tenders to be delivered at the offices of the Darlington Co-operative Society, addressed to the Secretary.

NOVEMBER 24.—**Stafford.**—SHOP.—The erection of a new shop and premises in the Gaol-road, Stafford, for the Stafford Industrial Co-operative Society, Ltd. Names and addresses not later than November 24 to Mr. R. A. Glass, of 104, Wolverhampton-road, Stafford, architect, from whom all particulars may be obtained.

NOVEMBER 26.—**Ardsley.**—WORK AT SCHOOLS.—The Ardsley (E. and W.) District Sub-Committee invite tenders for:—(1) Extending the urinal, converting present store-room into w.c.'s, and other work at the East Ardsley (Girls and Infant) School; (2) taking out the present lavatory basins and wood framing and fixing new lavatory basins, etc., in place of the old ones at the West Ardsley Blackgates School. Copies of specifications may be obtained from office of Mr. Alexander Angus, West Riding Education Office, 128, Northgate, Wakefield. Separate tenders must be submitted for each school. Sealed tenders, duly endorsed "East Ardsley Tender" or "Blackgates Tender," must be received by Mr. Angus not later than 10 a.m. on November 26.

NOVEMBER 26.—**Belfast.**—ASPHALT FLOORING.—The Belfast Harbour Commissioners invite tenders for the supply and laying down of asphalt flooring in premises at York Branch Dock, Belfast. Particulars of the work may be obtained on application to the Harbour Engineer, Mr. W. Redfern Kelly, M.Inst.C.E. Sealed tenders to be addressed to Mr. W. A. Currie, Secretary, Harbour Office, Belfast, endorsed "Tender for Asphalt Flooring," and sent in on or before November 26.

NOVEMBER 26.—**Belfast.**—SHOPS, ETC.—For the erection of two shops and dwelling-houses, Lisburn-road. Plans and specification may be seen at office of Mr. W. D. R. Taggart, architect, 2, Wellington-place, Belfast. Tenders to be lodged not later than 12 o'clock noon on November 26.

NOVEMBER 26.—**Cowick.**—ALTERATIONS TO HOUSE.—For the whole or several trades, viz., bricklayer and mason, carpenter and joiner, and plumber and glazier's work, required in the construction of new bay windows and internal alterations to The Grange, Cowick, near Snaith, for Mr. A. Hartley. Applications to Messrs. Thomas Winn & Sons, architects and surveyors, 84, Albion-street, Leeds, not later than November 25, when schedule bills of quantities will be forwarded.

NOVEMBER 28.—**Edinburgh.**—ALTERATIONS.—Edinburgh Magistrates and Council invite tenders for the mason, joiner, plumber, and plaster works of alterations to be made on property, 65-73, Henderson-row, conform to plans, specifications, and schedules of measurement prepared by the Burgh Engineer, from whom schedules of quantities and all particulars may be obtained. Sealed offers, endorsed "Tender for Alterations, Henderson-row," must be lodged with Mr. Thomas Hunter, W.S., Town Clerk, City-chambers, Edinburgh, not later than November 28, at 10 a.m.

NOVEMBER 28.—**Enfield.**—INFIRMARY.—Edmonton Guardians invite tenders for the erection of an infirmary for fifty beds at the Chase Farm Schools, The Ridgeway, Enfield, N. Drawings and specifications of the proposed work may be seen at the offices of the architect, Mr. Stuart Hill, 106, Cannon-street, E.C., and bills of quantities had on payment of 5*l.* 5s. (cheque). Sealed tenders to be delivered to Mr. F. Shelton, Clerk, Lower Tottenham, on or before 9 a.m. on November 28.

NOVEMBER 28.—**Glasgow.**—ALTERATIONS TO POLICE OFFICES.—Glasgow Corporation invite tenders for the several works required in connection with the proposed alterations on the Northern, Western, and Southern Police Offices. Specifications and forms of tender may be had on application at the Office of Public Works, City-chambers, 64, Cochrane-street. Sealed tenders, marked outside "Tender for Alterations, Police Offices," must be lodged with Mr. A. W. Myles, Town Clerk, City-chambers, Glasgow, not later than November 28.

DECEMBER 1.—**Tonypandy.**—INSTITUTE.—The Hibernian Band Institute, Tonypandy, invite tenders for the erection of additions to their premises, No. 76, Kenry-street, Tonypandy, where plans and specifications may be seen. Sealed tenders to be delivered to Mr. James Brookes, Secretary, tobacconist, Tonypandy, on or before December 1, endorsed "Tender."

DECEMBER 3.—**Dundalk.**—STORES BUILDING.—Great Northern Railway Company (Ireland) Directors invite tenders for a stores building (two stories) in brick, 181 ft. long by 30 ft. wide, with steel principal roof and steel girder supported floor; also offices, 34 ft. long, making a total length of block 215 ft., at their Dundalk Station. Parties wishing to tender may see the drawings and specification at the office of Mr. W. H. Mills, Engineer-in-Chief, Amiens-street, Dublin, or copies of them at the office of the District Engineer, Belfast, and can obtain at the said offices lithographed copies of the eight drawings and specification and form of tender on payment of 2*l.* 2s. (not returnable) per set. Quantities are not supplied. Tenders for the brickwork, or steelwork, or for the whole of the work, to be made out on the forms supplied by the Company, and endorsed "Tender for Stores Building," should be delivered to Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin, not later than 10 a.m. on December 3.

* DECEMBER 3.—**Hexham.**—NEW NAVE TO CHURCH.—The Committee for the restoration and completion of Hexham Abbey Church, Hexham, Northumberland, invite builders willing to compete in limited competition for the building of the new nave to send in their names on or before December 3. Address, with references, etc., to the Rector, Hexham Abbey Church, Hexham.

DECEMBER 3.—**Maidstone.**—ADDITIONS TO SANATORIUM.—Maidstone Borough Council invite tenders for the erection of additions to the administration block at the Sanatorium, Fant-lane. Specification and plans may be seen at the office of the Borough Surveyor, Fairmeadow. Sealed tenders, which will only be received on the form supplied, to be sent to Mr. S. L. Monckton, Town Clerk, Town Clerk's Office, King-street, Maidstone, not later than December 3.

DECEMBER 3.—**Woodbury.**—ALTERATIONS, ETC., TO LODGE.—For alterations and additions to The Lodge, near Woodbury, Devon, for Mr. W. Arnold, of Woodbury. Plans and specifications at offices of Messrs. E. H. Harbottle & Son, architects, County-chambers, Exeter. Tenders to be delivered to architects on or before December 3.

* DECEMBER 4.—**Droitwich.**—NEW POST-OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for a new post-office at Droitwich. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to the Postmaster at Droitwich. Bills of quantities and form of tender may be obtained at the undermentioned address on payment of 1*l.* 1s. Tenders must be delivered before 12 noon, December 4, addressed to the Secretary, H.M. Office of Works, etc., Storey's-gate, S.W., and endorsed "Tender for Droitwich New Post-office."

* DECEMBER 4.—**Romford.**—NURSES' HOME.—The Guardians of the Romford Union invite tenders for a home for twenty nurses, and connecting corridor at the Infirmary, in accordance with plans and specification prepared by the architect, Mr. James Kennedy, 25, Bedford-row, W.C., from whom bill of quantities and form of tender may be obtained on payment of 3*l.* 3s. Sealed tender, endorsed "Tender for Nurses' Home," to be sent to Mr. W. Smith, 13, North-street, Romford, by 4 p.m., December 4.

DECEMBER 4.—**Wrexham.**—CART SHED.—Wrexham T.C. invite tenders for the supply and erection of an iron cart shed at the Willow-road Depôt. Drawings and specification may be seen, and forms of tender obtained, at the office of Mr. John England, Borough Engineer and Surveyor. Tenders, endorsed "Wagon Shed," to be delivered to Mr. Lawson Taylor, Town Clerk, Guildhall, not later than 12 noon on December 4.

DECEMBER 5.—**Didsbury.**—SCHOOL.—Manchester Education Committee invite tenders for the erection of the Beaver-road Municipal School, Didsbury, Manchester. Plans may be seen, and a copy of the bills of quantities (including specification) obtained, at the Education Offices, Deansgate, Manchester, on a deposit of 2*l.* 2s. Tenders, on the official forms, and enclosed in the envelopes provided, must be delivered not later than December 5 next. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

DECEMBER 5.—**Dowlais.**—ALTERATIONS, ETC., TO COTTAGES.—For alterations and repairs to six cottages, Nos. 52, 53, 54, 55, 56, and 57, Gas-row, Dowlais, for the Dowlais Gas and Coke Company. Plan and specification may be seen at the offices, Gas Works, Dowlais. Sealed tenders to be sent to the Gas Works Offices, on or before December 5, addressed to Mr. J. Ll. Atkins, Chairman, endorsed "Tender for Alteration to Cottages."

DECEMBER 5.—**Rathdown.**—LABOURERS' COTTAGES.—At their meeting on December 5 the R.D.C. of the Rathdown No. 1 Rural District will consider tenders for building nine single labourers' cottages, twenty-five double labourers' cottages, and four cottages in one block. Contractor must send in separate and distinct tenders for both (*a*) masonry and (*b*) brickwork. Plans, specifications, and tender forms for the works can be obtained from Mr. Patrick Cuniam, Clerk of the Council, Loughlinstown, on payment of 5s., and tenders, endorsed "Tender for Cottages," are to be lodged in his office not later than 10 o'clock on the day above mentioned. The tenders must be made on the official forms, and contain the names and addresses of two solvent persons who are willing to join with him in a bond for the execution of the work of an amount of 50*l.* for each cottage.

* DECEMBER 5.—**Twickenham.**—POST-OFFICE.—The Commissioners of H.M. Works and Public Buildings invite tenders for a new post-office at Twickenham. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to Mr. J. Rutherford, at H.M. Office of Works, etc., Storey's-gate, S.W. Bills of quantities and forms of tenders may be obtained on payment of 1*l.* 1s. Tenders to be delivered before 12 noon, December 5, addressed to the Secretary, H.M. Office of Works, Storey's-gate, S.W., and endorsed "Tender for Twickenham New Post-office."

DECEMBER 5.—**Ullapool.**—ALTERATIONS, ETC., TO HOTEL.—Additions to and alterations on Caledonian Hotel, Ullapool. Plans and specification to be seen with Mr. William Mackenzie, architect, Dingwall, until November 26, and afterwards at the Hotel, Ullapool, and offers to be lodged with the architect on or before December 5.

DECEMBER 8.—**Albert Village.**—SCHOOL.—Leicestershire C.C. Education Committee invite tenders for the erection of a Council School at Albert Village, in the Urban District of Ashby Woulds, together with out-offices, drainage, and other works connected therewith. Conditions of contract, quantities, and form of tender may be obtained from the architects, Mr. W. H. Simpson, Corridor-chambers, Leicester, on payment of a sum of 2*l.* 2s. Sealed tenders, upon the forms supplied, to be sent in the envelopes provided, to office of Mr. W. A. Brockington, Director of Education, County Education Office, 33, Bowling-green-street, Leicester, not later than 10 a.m. on December 8, addressed to "The Chairman of the Buildings and Sites Committee."

* DECEMBER 10.—**Harborne.**—FIRE-STATION.—The Watch Committee of the City of Birmingham invite tenders for a fire-station at Harborne. Plans and specification may be seen, and quantities and form of tender obtained, of Mr. H. E. Stilgoe, City Engineer and Surveyor, Council House, Birmingham, on deposit of 5*l.* Tenders, on forms provided, and delivered at the above-mentioned offices (addressed to City Surveyor) on or before December 10.

DECEMBER 10.—**North Shields.**—COMMITTEE ROOMS.—Tynemouth Corporation invite tenders for pulling down existing buildings in Norfolk-street, North Shields, and erecting and completing new committee-rooms and offices. The drawings, etc., may be seen at the office of Mr. John F. Smillie, Borough Surveyor, Tynemouth, where copies of the bills of quantities and the general conditions may also be obtained on depositing the sum of 2*l.* 2s. Sealed tenders, endorsed "Tender for New Committee-rooms, etc.," are to be left at the office of the Surveyor not later than 10 a.m. on December 10.

* DECEMBER 10.—**Swansea.**—PAVILION.—The Royal National Eisteddfod of Wales, Swansea, 1907, invite tenders for a temporary pavilion in the Victoria Park, Swansea, to seat 16,000 persons. Contractors are invited to tender for either or both of the following, viz.:—(*a*) The timber work; (*b*) the canvas roofing. Plans and specifications may be seen, and bills of quantities obtained, on payment of 1*l.* 10s. on and after December 3, at the offices of the Joint Architects (see advt. in this issue). Tender, endorsed "Tender for Pavilion," on or before December 10, to Mr. A. B. Davies, General Secretary, 58, Wind-street, Swansea.

NO DATE.—**Lombardstown.**—BUILDING.—Lombardstown Co-operative Society, Lombardstown, Co. Cork, invite tenders for the erection of a three-story, stone-built and slated building. Plans and specification can be inspected at above address.

ENGINEERING, IRON, AND STEEL.

NOVEMBER 26.—**Swainsthorpe.**—PLANT.—For the supplying and fixing a new plant for raising and distributing water, including cast-iron tanks, at the Workhouse, Swainsthorpe. Plans and specifications can be inspected on application to the Master. Tenders to be sent in under seal, and endorsed "Water Supply," not later than 4 p.m., on November 26, to Mr. W. E. Ripley, Tombland, Norwich.

NOVEMBER 27.—**Hitchin.**—BOILER SHAFT.—Hitchin Guardians invite tenders for the erection of a new boiler shaft at the Union Workhouse, Hitchin. A plan and specification can be seen at office of Mr. A. E. Passingham, Clerk, at the Old Town Hall, Hitchin. Sealed tenders, endorsed "Boiler Shaft," to be received not later than 10 a.m. on November 27.

NOVEMBER 28.—**Dublin.**—RAILS AND CHAIRS.—Dublin, Wicklow, and Wexford Railway Company invite tenders for the supply of 800 tons bullhead steel rails (85lbs. per lin. yd.), with corresponding fishplates, half to be delivered in February and half in July; also for the supply of 600 tons bullhead cast-iron chairs, 300 tons to be delivered in January and 300 tons in June. Specifications and forms of tender can be had on application to Mr. S. J. Shannon, C.E., 1, Westland-row, Dublin. Tenders, marked "Tender for Rails and Chairs," and addressed to Mr. M. F. Keogh, Secretary, Westland-row Station, Dublin, to be forwarded so as to be received not later than 10 a.m. on November 28.

NOVEMBER 29.—**Bathgate.**—PIPES.—The Bathgate District Committee of the C.C. of the County of Linlithgow invite tenders for providing and delivering about 1,290 tons of 12-in., 10-in., and 4-in. diameter dry sand cast-iron pipes and special castings. Copies of the specification and schedule may be obtained at the office of the engineer, Mr. W. A. Tait, C.E., 72A, George-street, Edinburgh, on payment of 1*l*. Tenders, endorsed "Tender for Pipes," must be lodged with Mr. J. G. B. Henderson, Linlithgow, not later than November 29.

DECEMBER 1.—**Aberavon.**—GAS MAINS.—Aberavon Gas Committee invite tenders for the supply and delivery of:—3,360 yds. of 3-in. cast-iron gas mains; 1,020 yds. of 4-in. cast-iron gas mains; 600 yds. of 8-in. cast-iron gas mains. Further particulars to be obtained from Mr. A. J. Bond engineer and manager. Tenders, to be marked "Tender for Mains," to be delivered to Mr. M. Tennant, Town Clerk, not later than December 1.

DECEMBER 3.—**Holbrook.**—ALTERATIONS TO BRIDGE.—Samford R.D.C. invite tenders for carrying out repairs and alterations to the Mill Bridge, in the Parish of Holbrook. Plan and specification of the work required to be done can be seen at the office of the District Surveyor, Mr. W. C. Whiting, East Bergholt. Tenders to be delivered to Mr. Arnold J. Haward, Clerk, 34, Princes-street, Ipswich, on or before December 3.

DECEMBER 3.—**Solihull.**—MACHINERY.—Solihull Guardians invite tenders for supplying and fixing laundry machinery at the new laundry at their Workhouse, Solihull, in accordance with plans and specification prepared by Mr. W. H. Ward, architect, Paradise-street, Birmingham, where particulars can be seen and all information obtained. Tenders, endorsed "Tender for Laundry Machinery," to be addressed and delivered to Mr. Francis Ladbury Thompson, Clerk to the Guardians, Solihull, not later than 10 a.m. on December 3.

DECEMBER 4.—**Lytham.**—METERS, ETC.—Lytham U.D.C. Gas Committee invite tenders for one year for the following delivered at Lytham:—(1) Dry prepayment mefers; (2) prepayment gas cookers. All cookers are to be enamel lined, packed throughout, and provided with hot-air dome and oven, and to be fitted with enamel crown plate. Tenders, endorsed "Meters" or "Cookers," to be delivered at the office of Mr. Chas. A. Myers, Clerk to the Council, Council Offices, Lytham, on or before December 4.

DECEMBER 4.—**Lytham.**—CAST-IRON PIPES.—Lytham U.D.C. Gas Committee invite tenders for 120 yds. 3-in. and 150 yds. 4-in. T. and B. cast-iron gas pipes and specials, coated, d/d Lytham or Ansdell as directed. Tenders, specifying weight of each size of pipe, and endorsed "Tender for Gas Pipes," to be delivered at the office of Mr. Chas. A. Myers, Clerk to the Council, Council Offices, Lytham, on or before December 4.

DECEMBER 11.—**Cardiff.**—BRIDGE.—Great Western Railway Directors invite tenders for the construction of a bridge over the railway at Beresford-road Level Crossing, Cardiff. Plans and specification may be seen, and forms of tender and bills of quantities obtained, at the office of the engineer at Newport Station on and after November 20, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to Mr. G. K. Mills Secretary, Paddington Station, London, and marked outside "Tender for Beresford-road Bridge, Cardiff," will be received on or before December 11.

DECEMBER 12.—**Handsworth.**—TRAMWAY.—The U.D.C. of Handsworth invite tenders for the supply and delivery of the following in connexion with the tramways:—Contract No. 14.—Permanent way reconstruction and overhead equipment. Copies of the specification, with form of tender and condition of contract, etc., can be obtained from the Consulting Engineers, Messrs. Kennedy & Jenkin, 17, Victoria-street, Westminster, London, S.W., on payment of 3*l*. 3s. for the same. Tenders on the prescribed form, in sealed envelopes, and endorsed on the outside "Tramways Tender, Contract No. 14," must be delivered at office of Mr. H. Ward, Clerk, at the Council House, Handsworth, before noon on December 12.

DECEMBER 15.—**Wemmergill.**—BRIDGE WORKS.—North Riding of Yorkshire C.C. invite tenders for additions to and strengthening of Wemmergill Bridge (stone), at Wemmergill, on the Middleton-in-Teesdale and Brough main road. Plans and specification and bills of quantities at the County Surveyor's Office, County Hall, Northallerton, from December 3 to 15 inclusive, between the hours of 9.30 a.m. and 4 p.m. (Saturdays until 12 noon). Mr. W. G. Bryning, County Surveyor, County Hall, Northallerton.

JANUARY 3.—**York.**—RAILWAY.—North-Eastern Railway Directors invite tenders for the construction of the Selby and Goole Railway, about ten miles in length. The works comprise double line railways, chiefly on embankment (upwards of 1,000,000 cubic yds.), with stations, station yards, warehouses, cottages, and other buildings, sidings, and bridges. The steelwork of the latter will amount to about 1,100 tons. Plans may be seen, and specification, detailed quantities, and form of tender obtained, on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York, on and after November 21. Sealed tenders, marked "Tender for Selby and Goole Railway," to be addressed to the Secretary, and delivered at his office at York not later than noon on January 3.

NO DATE.—**Halifax.**—TAKING OUT HEATING APPARATUS.—For taking out heating apparatus, hot-water pipes, valves, etc., in connexion therewith, in premises No. 9, Weymouth-street, Halifax. Further particulars on application to Messrs. Thos. Kershaw, A.R.I.B.A., architect, L. and Y. Bank Chambers, Halifax.

MISCELLANEOUS.

NOVEMBER 26.—**Ashton.**—SCAVENGING.—Ashton-upon-Mersey U.D.C. invite tenders for the emptying of ashpits and the removal of house refuse, nightsoil, etc., for a period of two years, commencing on January 7, 1907. Particulars, conditions, and form of tender may be obtained from Mr. James Oldie Barrow, Clerk and Collector, Council Offices, Barker's-lane, Ashton-upon-Mersey, or Mr. Fred. Hutton, Surveyor and Inspector, Public Hall, Ashton-lane, Ashton-upon-Mersey. Sealed tenders, marked "Nightsoil," must be received at the Council Office, Barker's-lane, Ashton-upon-Mersey, not later than November 26.

NOVEMBER 26.—**Stockport.**—TREES, ETC.—Stockport Guardians invite tenders for the supply and planting of about 2,000 trees and shrubs at the Stepping Hill Hospital, near Stockport. Schedule and form of tender may be obtained upon application to Mr. Charles F. Johnson, Clerk to the Guardians, Union Offices, Shaw Heath, Stockport. Tenders are to be sent in not later than 10 a.m. on November 26, endorsed "Tender for Trees and Shrubs."

NOVEMBER 26.—**Surbiton.**—CART REPAIRS.—The U.D.C. of Surbiton invite tenders for repairing their water vans and carts. Specification of the work to be done, and form of tender can be obtained, on application to Mr. Henry T. Mather, Surveyor, Council Offices, Surbiton, and the carts and vans can be inspected at the Highway Depôt. Tenders, enclosed in sealed envelopes, endorsed "Water-cart Repairs," must be delivered before noon on November 26.

NOVEMBER 27.—**Manchester.**—PULLING DOWN, ETC.—Manchester Improvement and Buildings Committee invite tenders for the pulling down and removal of the building materials comprised in St Peter's Church, St. Peter's-square. Plans can be inspected, and conditions of sale and full particulars obtained, on application at the City Surveyor's Office, Town Hall. Tenders to be delivered not later than 5 p.m. on November 27.

NOVEMBER 27.—**Snodland.**—SCAVENGING.—Snodland P.C. invites tenders from the ratepayers of Snodland for scavenging the Parish during 1907. Forms of tender may be obtained at office of Mr. Tom Hilder, Clerk to the Council. Tenders must be returned to the Clerk, endorsed "Tenders for Scavenging," before noon, November 27.

NOVEMBER 27.—**Swansea.**—FENCING.—Swansea Corporation invite tenders for fencing a portion of the East Burrows Wharf, and supplying and fixing a refuse shoot, or a tipping platform, on the Quay wall. Further particulars may be obtained on application to the Borough Surveyor, 13, Somerset-place. Sealed tenders, endorsed "Tender for Fencing," "Refuse Shoot," or "Tipping Platform," as the case may be, to be delivered at offices of Mr. Jno. Thomas, Town Clerk, Guildhall, Swansea, not later than noon on November 27.

NOVEMBER 28.—**Liskeard.**—HAULING.—Liskeard T.C. invite tenders for hauling about 100 cubic yds. of gravel from St. Mary's Lead Works, Menheniot, to the Cattle Market, Liskeard. Tenders at per cubic yard to be sent to the Town Clerk not later than November 28, marked outside "Tender." Further particulars to be obtained from the Borough Surveyor.

NOVEMBER 29.—**Audlem, Nantwich.**—SCAVENGING.—Nantwich R.D.C. invite tenders for three years, from December 25 next, for emptying pails containing nightsoil, and conveying the same away every week, and for emptying ashpits once every three months, and for emptying privies and ashpits and conveying the contents away four times every year. Further particulars may be obtained from the Council's Inspector, Mr. John Storey, at his office in Pillory-street, Nantwich. Tenders to be sent in to Mr. C. E. Speakman, Clerk to the Council, Union Offices, Nantwich, not later than November 29.

NOVEMBER 29.—**Cork.**—TIMBER.—Cork Guardians will on November 29, up to the hour of 11 o'clock a.m., receive in the tender box, Board room, tenders for supply of timber during period ending March 25, 1907. Tender forms may be obtained at the Board-room, Workhouse. Mr. John Cotter, Clerk of Union.

NOVEMBER 29.—**Greenwich.**—BOARDS.—Greenwich Guardians invite tenders for 10 fathoms of firewood boards, lengths to be multiples of 6 in., for Grove Park Workhouse, Lee, S.E. Forms of tender can be obtained on application at the Union Offices, Woolwich-road, Greenwich, and must be returned before November 29. Mr. Samuel Saw, Clerk to the Guardians.

NOVEMBER 29.—**Stockbridge, Edinburgh.**—WIRING, BELLS, ETC.—Edinburgh City Council invite estimates for wiring, bells, telephones, etc., at the District Police and Fire Station, Saunders-street, Stockbridge. Plans and samples may be seen at the office of the Firemaster, Central Fire-station, Lauriston, who will also furnish a copy of the specification and tender form to personal applicants only. The estimates must be sent to Mr. R. Morham, City Architect, Public Works Office, City-chambers, Edinburgh, by 10 a.m. on November 29, sealed and marked "Tender for Wiring, Bells, etc., at Saunders-street Police and Fire Station."

DECEMBER 1.—**Barton.**—SCAVENGING.—Barton-upon-Humber U.D.C. invites tenders for the scavenging of the whole town, from February 1 next. Forms of tender and of the specification may be had on application to Mr. D. Houghton, the Inspector. Tender must be sent to the Inspector, in a sealed envelope, endorsed "Tender for Scavenging," and must reach him not later than 12 o'clock noon on December 1.

DECEMBER 1.—**Haughton-le-Skerne.**—SCAVENGING.—Darlington R.D.C. invite tenders for scavenging the whole of the Parish of Haughton-le-Skerne, from December 1, 1906, to November 30, 1907. Haughton-le-Skerne Parish includes the new houses on the Harrowgate Hill Estate. Forms of tender may be had on application to Mr. John Robinson, Union Offices, Darlington. Tenders to be sealed and endorsed "Tender for Scavenging Haughton-le-Skerne," to be sent to Mr. C. H. Leach, Clerk to the Council, Union Offices, Darlington, before noon on December 1.

DECEMBER 1.—**Redworth.**—SCAVENGING.—Darlington R.D.C. invite tenders for scavenging Brusselton Cottages, in the Parish of Redworth, from December 1, 1906, to November 30, 1907. Forms of tender may be had on application to Mr. John Robinson, Union Offices, Darlington. Tenders to be sealed and endorsed "Tender for Scavenging, Brusselton Cottages," to be sent to Mr. C. H. Leach, Clerk to the Council, Union Offices, Darlington, before noon on December 1.

DECEMBER 1.—**Willerby, Hull.**—FURNITURE.—Hull City Asylum Committee of Visitors invite tenders for the supply of furniture, etc., for the furnishing of the new wards, dormitories, attendants' rooms, etc., at the City Asylum, Willerby, near Hull. Samples of certain of the articles of furniture can be seen at the Asylum on application to the Steward and Storekeeper. Forms of tender, together with a list of the several articles required, can be obtained on application to the Town Clerk, at the Town Hall, Hull. Tenders must be addressed to the Chairman of the Asylum Committee, Town Hall, Hull, endorsed "Tender for Furniture," and delivered at or before 11 o'clock a.m. on December 1.

DECEMBER 3.—**Malling.**—SCAVENGING.—Malling R.D.C. invite tenders for scavenging as under:—For the Parish of Wouldham:—The scavenging to be done by means of cess-pool emptiers, scavenging carts, and appliances, which will be supplied by the Council. The contract to be from December 26, 1906, to December 31, 1907, inclusive. For the Parishes of East Malling and Ditton:—For the supply of horses, harness, and men for scavenging. The contract to be for twelve months, from December 31, 1906. For the Parish of West Malling:—For the supply of horses, harness, and men for sanitary purposes. The contract to be for twelve months, from December 31, 1906. Full particulars and conditions can be obtained upon application to Mr. C. Souter, Inspector of Nuisances, West Malling. Sealed tenders, endorsed "Tender for East Malling and Ditton Scavenging," "Tender for Wouldham Scavenging," "Tender for West Malling Horse Hire, etc.," as the case may be, to be sent to Mr. Fredk. J. Allison, Clerk to the Council, Council Offices, West Malling, not later than December 3.

DECEMBER 5.—**Lancing.**—SCAVENGING.—Steyning West R.D.C. invite tenders for the removal of house refuse, and cleansing of ashpits from a defined area of the Parish of Lancing, from December 26, 1906, to March 25, 1908. Tenders must be sent to office of Mr. Edward Cripps, Solicitor and Clerk to the R.D.C., Union Offices, New Shoreham, Sussex, before 9 o'clock in the forenoon on December 5 next, endorsed "Tender for Removal of House Refuse." The plan of the defined area is deposited at the office of the Clerk of the Parish Council of Lancing.

DECEMBER 10.—**South Shields.**—DISINFECTANTS.—South Shields Corporation invite tenders for the supply of disinfectants for a period of one year, beginning on January 1, 1907. Forms of tender and other information may be obtained from Dr. Mostyn, Health Office, Russell-street, South Shields. Sealed tenders, marked "Tender for Disinfectants," to be delivered, together with samples, not later than 5 p.m. on December 10, at the office of the Town Clerk, Court-buildings, South Shields.

DECEMBER 12.—**Dublin.**—CHAINS AND CORDAGE.—The Dublin Port and Docks Board invite tenders for the supply of the following articles from January 1 next to December 31, 1907:—Chains, cordage. Securities will be required. Sealed tenders, addressed to Mr. N. Proud, Secretary, Port and Docks Office, Westmoreland-street, Dublin, and endorsed on the outside, "Tenders for ——," naming the articles, will be received up to December 12.

NO DATE.—**Barnsley.**—SINKING PIT SHAFT.—For the sinking of a pit shaft, 14 ft. diameter, a depth of 130 yds., located near Barnsley. Name and address to E. 166, *The Yorkshire Post*, Leeds.

NO DATE.—**Saltburn-by-the-Sea.**—STORAGE BATTERY.—The Cleveland Trust, Ltd., invite tenders for the supply, delivery, and erection of a storage battery in their electricity works, Saltburn-by-the-Sea. Specification and form of tender can be obtained on payment of a deposit of 1*l*. 1s., which will be returned on receipt of a *bond fide* tender. The Cleveland Trust, Ltd., Royal Exchange, Middlesbrough.

NO DATE.—**Widdrington.**—DRIVING A DRIFT.—For the driving of a stone drift at Widdrington Colliery, about 140 yds. in length, to be 8 ft. wide, 5½ ft. high. Further particulars can be had at Colliery Office. Apply Manager.

PAINTING, etc.

NOVEMBER 26.—**Darlington and Eastbourne.**—PAINTING, ETC.—The Guardians of the Darlington Union invite tenders for painting, distempering, and white-washing at the Girls' Home in Queen-street, and the Boys' Homes, Eastbourne. Specification can be seen at the Workhouse. Tenders, duly endorsed, may be delivered to Mr. Chas. H. Leach, Clerk to the Guardians, Union Offices, Darlington, not later than 9 a.m. on November 26.

DECEMBER 3.—**Nottingham.**—PAINTING, ETC.—Nottingham Education Committee invite tenders for internal cleaning and painting at the following Council schools:—Bosworth-road Southwark, Sycamore-road, Clarendon-street, Leen-side, Radford Boulevard. The whole of the work will require to be completed between December 14, 1906, and January 3, 1907. Specifications, bills of quantities, and forms of tender may be obtained from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1*l*. for each school. Sealed tenders, properly endorsed, to be delivered to the City Architect not later than 10 a.m. on December 3.

DECEMBER 4.—**Halifax.**—PAINTING.—Halifax Improvement Committee invite tenders for the painting work required to the exterior of Corporation property situate in various parts of the Borough. Specifications, quantities, and forms of tender may be obtained on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax. Tenders, properly endorsed, must be sent to Mr. Keighley Walton, Town Clerk, not later than 12 o'clock noon on December 4.

NO DATE.—**Somersetshire.**—PAINTING.—For the cleaning and painting of a large lattice girder bridge on the sea coast in Somersetshire. Specifications on deposit of a postal order for 1*l*. 1s. Apply P. 7, *Western Mail* Office, Cardiff.

NO DATE.—**Sutton Scotney.**—PAINTING.—Tenders invited for outside painting at Sutton Scotney Nursery. Particulars of Brendmore, Winchester, or Sutton Scotney.

ROADS, SANITARY, AND WATER WORKS.

NOVEMBER 26.—**East Preston.**—SCREENING CHAMBER.—East Preston Guardians invite tenders for the construction of a screening chamber and other works, in connexion with the drainage of the Workhouse at East Preston. Plan and specification can be seen on application to Mr. H. M. Potter,

architect, Worthing. Sealed tenders to be sent to Mr. Arthur Shelley, Littlehampton, not later than November 26.

NOVEMBER 26. — **Harrogate.** — STREET WORKS. — Harrogate Corporation invite tenders for private street works required in back road at the side of No. 4, Springfield-avenue. The specification may be seen, and quantities obtained, at office of Borough Engineer and Surveyor, Mr. F. Bagshaw. Tenders must be submitted not later than 9 a.m. on November 26.

NOVEMBER 27.—**Bootle.**—PAVING.—The Corporation of Bootle invite tenders for the supply of granite paving materials. Forms of tender may be obtained at the office of Mr. B. J. Wolfenden, A.M.Inst.C.E., Borough Engineer, Town Hall. Tenders to be sent to the Town Clerk on or before 10 a.m. on November 27, endorsed "Tender for Granite Paving Materials."

NOVEMBER 27.—**Poole.**—ROAD WORKS.—Poole B.C. invite tenders for the following works:—Making-up, under the Private Street Works Act, Motcombe-road, Ormonde-road, Eaton-road, and Chester-road. Particulars may be obtained on application to the Borough Surveyor. Tenders to be delivered at the Borough Surveyor's Office before 9.30 a.m. on November 27. Mr. Samuel J. Newman, F.R.I.B.A., Borough Surveyor, King-street, Poole.

NOVEMBER 27.—**Seaforth.**—PRIVATE STREET WORKS.—The U.D.C. of Waterloo-with-Seaforth invite tenders for works of sewering, flagging, kerbing, channelling, paving, etc., in Fort-road, Seaforth. Plans and specifications may be seen, and bills of quantities and forms of tender obtained, on application to Mr. F. Spencer Yates, A.M.Inst.C.E., the Surveyor to the Council, at the Town Hall, Waterloo. The sum of 10s. 6d. must be deposited for quantities. Sealed tenders on the forms supplied, addressed to the Chairman of the General Purposes Committee, and endorsed "Tender for Private Street Works," are to be delivered at the Town Hall, Waterloo, not later than 12 o'clock at noon on November 27.

NOVEMBER 27.—**Seaforth and Waterloo.**—ROAD, ETC., WORKS.—The U.D.C. of Waterloo-with-Seaforth invite tenders for works of sewering, paving, flagging, kerbing, channelling, etc., in the following streets and passages, viz.:—Tuscan-street, Seaforth; Grecian-street, Seaforth; Hornby-street, Seaforth; Hougoumont-avenue, Waterloo. Passages in Waterloo:—Passage at the rear of Nos. 25 to 53, Denmark-street; passage between Nos. 2 and 4, Sandon-street; passage between Milton and Molyneux roads; passage between Molyneux and Galloway roads; passage between Galloway and Winstanley roads; passage at the rear of Nos. 17 to 29, Oxford-road and Nos. 1 to 9, Blucher-street; passage at the rear of No. 3, Sandringham-road and Nos. 2 to 6, Sandringham-avenue; passage at the rear of No. 1, Sandringham-road and Nos. 1 to 7, Sandringham-avenue; passage at the rear of Nos. 2 to 6, Rockland-road; passage at the rear of Nos. 12 to 22, Rockland-road; passage at the rear of Nos. 24 to 32, Rockland-road. Passages in Seaforth:—Passage between Cambridge and Fernlea roads; passage at the rear of Nos. 37 to 55, Seaforth-road and Nos. 2 to 10, Seaforth-vale; passage between Nos. 40 and 42, Henley-street; passage at the side of No. 72, Granville-road and the rear of "Beaconsfield," Crosby-road South; passage between the Mission-room and No. 9, Caradoc-road; passage at the side of No. 4, Henley-street and the rear of Nos. 41 to 45, Caradoc-road; passage at the side of No. 3, Green-lane and the rear of Nos. 3 to 13, Green-lane; passage between Nos. 36 and 38, Granville-road. Plans and specifications may be seen, and bills of quantities and form of tender obtained, on application to Mr. F. Spencer Yates, A.M.Inst.C.E., the Surveyor to the Council, at the Town Hall, Waterloo. The sum of 10s. 6d. must be deposited for quantities. Sealed tenders, on the forms supplied, addressed to the Chairman of the General Purposes Committee, and endorsed "Tender for Private Street Works," are to be delivered at the Town Hall, Waterloo, not later than 12 o'clock at noon on November 27.

NOVEMBER 28.—**Brentwood.**—SEWERS.—The U.D.C. of Brentwood invite tenders for the construction of about 150 ft. of 6-in. and 4-in. sewers, about 150 ft. of 4-in. surface water drain, with manholes and inspection chambers, at the rear of cottages, Coptfold-road, Brentwood, according to the plan and specification to be seen by appointment with Mr. A. J. Meeson, Surveyor, Town Hall, Brentwood. Tenders to be sent to Mr. C. Edgar Lewis, Clerk, Brentwood, by November 28.

NOVEMBER 28. — **Edinburgh.**—ROADS.—Edinburgh City Council invite estimates for forming new roads and drains at Claremont-road, according to plans and specification, which may be seen at office of Mr. R. Morham, City Architect, Public Works Office, City-chambers, Edinburgh, where also schedules of quantities may be obtained, on personal application only. The estimates must be sent to Architect by 10 a.m. on November 28, sealed and marked "Tender for Roads and Drains at Claremont-road."

NOVEMBER 28.—**Enniskerry.**—SEWERAGE WORKS.—Rathdown No. 2 R.D.C. will, at their meeting on November 28, receive tenders for the Sewerage Works at Enniskerry, Co. Wicklow, and other works connected therewith, in accordance with the plans, specifications, etc., prepared by the engineers, Mr. J. H. Ryan, M.Inst.C.E., and Mr. R. M. Butler, A.M.Inst.C.E. Conditions, specification, and quantities can be inspected, and forms of tender obtained, at the engineers' office, 22, Nassau-street, or at the Clerk's office, Loughlinstown. Sealed tenders, upon the form supplied, to be sent in and addressed to the Chairman of the Council, and endorsed "Tender for Enniskerry Main Drainage."

✱ NOVEMBER 28.—**Kingston.**—DRAINAGE.—The War Department invite tenders for the reconstruction of drainage at Kingston Brigade Depôt in the Eastern Command. The plans, specification, and conditions of contract may be inspected at the office of Mr. H. B. Measures, Architect, War Office, Atterbury-street, Grosvenor-road, S.W., on November 26, 27, and 28 only, and bills of quantities and form of tender obtained on those days only on payment of 10s.

NOVEMBER 29. — **Bathgate.** — WATERWORKS.—The Bathgate District Committee of the C.C. of the County of Linlithgow invite tenders for cutting tracks and for laying about six miles of cast-iron pipes, 12 in. to 4 in. diameter. Plans may be seen, and copies of the specification and schedule obtained, at the office of the engineer, Mr. W. A. Tait, C.E., 72A, George-street, Edinburgh, on payment of 1l. Tenders, endorsed "Tenders for Pipe Tracks," must be lodged with Mr. J. G. B. Henderson, Linlithgow, not later than November 29.

NOVEMBER 30. — **Pontypridd.** — STREET WORKS. — Pontypridd U.D.C. invite tenders for the following works:—Contract No. 1, 376 yds. of stoneware pipe sewers and contingent works; contract No. 2, private street works in Graig-terrace; contract No. 3, private street works in Madoc-street; contract No. 4, private street works in Factory-lane; contract No. 5, private street works in Wood-street, Cilfynydd. Plans may be seen, and specifications and bills of quantities obtained, at the office of the engineer and surveyor, Mr. P. R. A. Willoughby, A.M.Inst.C.E. Tenders, on the prescribed form, sealed, and endorsed "Contract No. " (as the case may be), must be received by Mr. J. Colenso Jones, Clerk to the Council, Municipal Buildings, Pontypridd, on or before November 30.

NOVEMBER 30.—**Slough.**—MAKING-UP ROAD.—Slough U.D.C. invite tenders for the supply of materials and labour required in making-up, etc., Gray's-road, Slough. Plans and specifications may be seen, and schedules of quantities obtained, from Mr. W. W. Cooper, Town Surveyor, Slough, on payment of a deposit of 1l. 1s. Sealed tenders, endorsed "Private Street Works," addressed Chairman of Highways Committee, 1, Mackenzie-street, Slough, to be sent in on or before November 30.

DECEMBER 1-21.—**Bishop Middleham.**—SEWERAGE WORKS.—The R.D.C. of Sedgefield invite tenders for the execution of a scheme of main sewerage and sewage disposal for Bishop Middleham. The proposed works in this contract comprise the furnishing and laying of about 2,200 yds. of 12-in., 9-in., 8-in., 7-in., and 6-in. fireclay and cast-iron pipe sewers with Gaskin and cement joints, with manhole and lamphole shafts, storm overflow and screening chambers, bacterial tanks, and filters, fencing, cartroad, etc. Names and addresses, not later than December 1, to the engineers for the works, Messrs. D. Balfour & Son, Civil Engineers, 3, Nicholas' Buildings, Newcastle-on-Tyne, accompanied by a cheque for 3l. Sealed tenders, endorsed "Tender for Bishop Middleham Sewerage," must be sent to Mr. J. W. Lodge, Clerk to the said Council, Union Offices, Sedgefield, Ferryhill, not later than 10 a.m. on December 21.

DECEMBER 1.—**Paddington.**—PAVING.—Paddington B.C. invite tenders for paving with granite setts the passageway at the rear of Beethoven-street, and the execution of contingent works, all the granite setts and certain other materials being supplied from the Council's stock. General conditions, specifications, schedule of quantities, and forms of tender will be furnished upon application to the Borough Surveyor, Town Hall, Paddington, W., upon payment of 1l. for a set containing one copy of each document. Tenders, endorsed "Passageway," to be addressed to the Town Clerk, and delivered at the Town Hall not later than December 1.

✱ DECEMBER 1. — **Swanage.** — ROADS.—The Swanage U.D.C. invite tenders for making-up various roads on the Court Park Estate, Swanage, in accordance with plans, specification, and conditions prepared by the Council's Surveyor, which can be seen at the Town Hall, Swanage. Tenders must be separate for each road, and furnished on forms which can be obtained at the Council's Office, on payment of 1l. 1s., and must be sent to Mr. Thos. Randell, Clerk, Town Hall, Swanage, in a sealed envelope, marked outside "Tender for Making-up Roads on Court Park Estate, before noon, December 1.

DECEMBER 3.—**Taunton.**—PRIVATE STREET WORKS.—The Taunton T.C. invite tenders for the construction and making-up of Gyffarde-street and Stephen St. Priory. Plans and specification may be seen, and form of tender and quantities obtained, at the office of Mr. David Edwards, A.M.Inst.C.E., Borough Engineer and Surveyor, Municipal Buildings, Taunton. Sealed tenders, endorsed "Private Street Works," to be addressed to the Town Clerk, Municipal Buildings, on or before December 3.

✱ DECEMBER 4.—**New Cross.**—SANITARY CONVENIENCE.—The Deptford B.C. invite tenders for a sanitary convenience at Amersham-road, New Cross, according to drawings and specification, which can be seen at the Borough Surveyor's Office at the Town Hall. Sealed tenders, on forms to be obtained at the Town Hall, must be sent to Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross-road, S.E., before 4, December 4.

DECEMBER 4.—**Radyr.**—STREET IMPROVEMENTS.—Llandaff and Dinas Powis R.D.C. invite tenders for private street improvement works in Railway-terrace, Radyr, in accordance with specification, which may be seen, and bills of quantities obtained, on application to the surveyor, Mr. James Holden, A.M.I.C.E., Park House, 20, Park-place, Cardiff. Tenders, sealed and endorsed, to be sent to Mr. M. Warren, Clerk, Park House, Cardiff, not later than 12 o'clock noon on December 4.

DECEMBER 10.—**Glasford.**—SAND FILTER BEDS.—The District Committee of the Middle Ward of the County of Lanark invite tenders for the construction of additional sand filter beds at Glasford. Plans may be seen, and copies of the specification and schedule obtained, at the office of the engineers, Messrs. J. & A. Leslie & Reid, C.E., 72A, George-street, Edinburgh, on payment of 1l. An assistant engineer will meet intending offerers at Glasford Station on November 23, at 10.30 a.m., to point out the position of the works. Tenders, endorsed "Tender for Contract No. 77," must be lodged with Mr. W. E. Whyte, District Clerk, Hamilton, not later than December 10.

✱ DECEMBER 11.—**Wantage.**—DRAINS.—The Guardians of the Wantage Union invite tenders for the construction of drains at the Workhouse in accordance with plans and specification, which can be inspected on application to Mr. E. B. Ormond, Union Offices, Wantage. Tenders, sealed and endorsed "Tender for Workhouse Drainage," must be sent to above-mentioned address before 10 a.m., December 11.

DECEMBER 22. — **Gordon.** — DRAINAGE WORKS. — Berwickshire C.C. West District invite tenders for works in connexion with Gordon Drainage scheme. Plans and specification may be seen, and schedule of quantities and form of tender had, on application to the engineer, Mr. T. R. Atkinson, Earlston. The engineer will be at Gordon Station on December 11, at 12 o'clock, to meet intending offerers. Tenders to be sent in on forms supplied, endorsed "Gordon Drainage," to Mr. George Rankin, W.S., Lauder, not later than December 22.

JANUARY 7. — **Stourport.** — SEWERAGE WORKS. — Stourport U.D.C. invite tenders for the provision, laying, and jointing of cast-iron and stoneware pipe sewers, together with manholes, lampholes, and flushing chambers, the construction of tank sewer, engine-house, liquefying tanks, distributing carriers, effluent drains, and other incidental works. Drawings and specification may be seen, and bills of quantities obtained, at the offices of the engineers, Messrs. Wilcox & Raikes, of 63, Temple-row, Birmingham, on and after November 26, on payment of a deposit of 5l. 5s. Sealed tenders, in the envelopes supplied, endorsed "Stourport Sewerage—Contract No. 1," to be delivered at office of Mr. C. Hugh Watson, Clerk to the Council, Stourport, not later than 12 o'clock noon on January 7.

NO DATE. — **Strensall.** — PIPE SEWER. — Flaxton R.D.C. invite tenders for the laying of about 370 lin. yds. of 9-in. sanitary pipe, together with the construction of the various manholes, etc., that may be required. Names and addresses to the Council's Surveyor, Mr. E. T. Felgate, 3, Stonegate, York.

STONE, MATERIALS, AND STORES.

NOVEMBER 26.—**Kingstown.**—ANNUAL SUPPLIES, ETC.—The U.C. of Kingstown invite tenders for the supply, in such quantities as may be required from time to time during twelve months ending December 31, 1907, of general stores, broken stones, gravel, cement, etc., according to particulars. Specifications and form of tender may be obtained on application at the offices of the Town Surveyor, Town Hall, on any day between the hours of 10 a.m. and 2 p.m. Tenders, sealed and endorsed, should be sent in to Mr. M. A. Manning, Town Clerk, Town Hall, before 10 o'clock a.m. on November 26.

NOVEMBER 26. — **London.** — STORES.—The Great Northern Railway Company Directors invite tenders for the supply of certain new and the purchase of old stores for twelve months from January 1 next. A list of the contracts, and separate forms of tender for each contract, may be obtained upon application to Mr. Weeks, the Stores Superintendent, Doncaster. The stores must be in every case equal in quality to the Company's sealed samples and patterns, which will be exhibited in the Stores Department, Doncaster, where they may be inspected, on application to the Stores Superintendent between the hours of 10 a.m. and 4 p.m. Tenders, addressed to the Stores Committee, marked on the outside with a description of the stores tendered for, must be sent to the Company's Offices at King's Cross, in the envelope specially provided, so as to be received by not later than 9.30 o'clock a.m. on November 26.

DECEMBER 1.—**Glasgow.**—STORES.—The Directors of Messrs. G. & J. Burns, Ltd., invite tenders for the supply of all or any of the undermentioned stores, in such quantities as may, from time to time, be required, for a period of twelve months from January 1, 1907:—Section I.—Engine oil, Stettin colza oil (for burning), rapeseed oil, cylinder oil. Section II.—Paint or boiled oil, turpentine, turpentine varnish, black varnish, white lead (genuine), red lead (genuine), stone colour paint, teak colour paint, bottom colour paint, black paint, ground bath brick. Section IV.—Ships' hose, Tuck's packing. Section V.—White waste, coloured waste. Section VI.—Brushes (assorted), as per list. Section VII.—Cordage, as per list. Section VIII.—Steel wire rope. Printed forms of tender may be had on application at 49, Queen's-square, Belfast, and sealed offers (marked on outside "Tender for Stores") must be lodged at 30, Jamaica-street, Glasgow, not later than December 1. Mr. A. M. Kay, Secretary.

DECEMBER 3.—**Aberdare.**—STORES.—The Directors of the Powell Duffryn Steam Coal Company, Ltd., invite tenders for the supply of the undermentioned stores from January 1, 1907:—(1) Bar and other iron; (2) bolts, nuts, and rivets, etc.; (3) brass fittings; (6) india-rubber and asbestos; (7) colliers' tools, etc.; (8) leather goods, etc.; (9) ironmongery; (10) girders, channels, and rails; (11) nails; (13) steel; (14) steam tubes and fittings; (15) brattice cloth and waste; (17) chains; (19) timber, deals, etc.; (22) horse feed; (23) wire ropes; (24) French pitwood; (24A) Swedish pitwood; (26) electrical fittings. Forms of tender and all particulars can be obtained on application to the Stores Manager, Aberaman Offices, near Aberdare. Tenders to be addressed to the Directors of the Powell Duffryn Steam Coal Company, Ltd., 101, Leadenhall-street, London, E.C., and posted so as to be received not later than 10 a.m. on December 3.

DECEMBER 3.—**Aberdeen.**—STORES.—The Directors of the Great North of Scotland Railway Company invite tenders for the supply of the undermentioned stores, for six or twelve months (in the Company's option), from January 1, 1907:—(1) Brooms, brushes, etc.; (2) canvas, ropes, flax, and twine; (3) carriage cloth and trimmings; (4) carriage furnishings (locks, hinges, etc.); (5) cement and lime; (6) chamois skins and sponges; (7) cotton waste, lamp wick, sponge cloths, flannel, etc.; (8) crucibles; (9) drysalteries; (10) electric lighting material; (11) files and steel; (12) fireclay bricks, pipes, etc.; (13) galvanised fencing and signal wire, and steel tail ropes; (14) glass (plate and sheet), lamp chimneys, etc.; (15) handles (hammer, etc.); (16) india-rubber goods and engine packing; (17) iron, bar; (18) iron castings; (19) ironmongery, implements, and tools; (20) lamp mounting; (21) lead, solder, and tinplate; (22) leather and leather belting; (23) motor spirit; (24) nails, tacks, taper pins, screws, and cotter pins; (25) oils, tallow, and turpentine; (26) paints, colours, and wallpaper; (27) soap and candles; (28) spikes, wood screws, and washers; (29) springs (bearing, buffing, etc.); (30) steel boiler tubes; (31) steel tyres for engines, carriages, and waggons; (32) transfers (carriage, etc.); (33) varnishes; (34) Yorkshire iron

and rivets. Forms of tender can be obtained from the Stores Superintendent, 80, Guild-street, Aberdeen, on payment of 1s. for each form. Patterns may be inspected at the Stores Depôt, Inverurie, between the hours of 10 a.m. and 4 p.m., from November 23 to 30, inclusive, except on the 24th, when they will not be on view after 12 o'clock noon. Tenders, endorsed "Tender for Stores," must be lodged with Mr. T. S. Mackintosh, Secretary, Company's Offices, 80, Guild-street, Aberdeen, not later than 10 a.m. on December 3.

DECEMBER 3.—**Edinburgh.**—STORES.—The Edinburgh and District Water Trustees invite offers to supply Queensberry and Spanish bar lead, lead pipe, solder, and rope yarn. Specifications can be obtained at the office of the Works Department, 12, St. Giles-street, Edinburgh. The offers, endorsed "Tender for Lead," must be lodged with Mr. William Boyd, W.S., Clerk to the Trust, Edinburgh and District Water Trust Offices, Edinburgh, on or before December 3.

DECEMBER 3.—**Norwich.**—MATERIALS.—City of Norwich Corporation invite tenders for the supply of the following materials and work during 1907:—Gravel, flints, etc.; paving setts; materials for macadam roads; cement; ironware drainage pipes and fittings; stoneware ditto; British wood; foreign wood; iron; cast-iron manhole covers, gullies, etc.; bricks; tar shingle for bottoms; footpath tar-paving and tar-macadam materials; brushes; engine fitter, boiler maker, and founder. The necessary specifications, forms of tender, etc., may be obtained at office of Engineer. Tenders on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed "Tender for ——," and addressed to the Chairman of the General Purposes Committee, must be delivered at office of Mr. Arthur E. Collins, M.Inst.C.E., City Engineer, etc., Guildhall, Norwich, not later than 10 a.m. on December 3.

DECEMBER 3.—**Wombwell.**—ROAD MATERIALS.—Wombwell U.D.C. invite tenders for the supply during the year ending December 31, 1907, of the following quantities of road materials:—750 tons lump dross, best quality; 750 tons 2½-in. machine-broken dross, best quality—the above to be free from honeycomb and spongy pieces; also 300 tons 3-in. hand-broken blue rock or whinstone. Forms of tenders may be obtained from Mr. J. W. Harrison, Surveyor to the Council, Town Hall, Wombwell, to whom all tenders, endorsed "Tenders for Materials," together with samples of the materials tendered for, must be delivered on or before December 3, at 12 o'clock noon.

DECEMBER 5.—**Leicester.**—MATERIALS.—Leicester Corporation invite tenders for the supply of the undermentioned materials, as may be ordered during the year 1907:—(1a) Iron and steel; (1b) ironmongery, etc.; (2) oils, paints, and sundries; (3) timber—English; (4) timber—foreign; (5) hemp, rope, gasket, cotton waste, etc.; (6) sewerage and other ironwork, etc.; (7) bricks. Form of tender, etc., may be obtained on deposit of 10s. Cheques, etc., to be made payable to the Borough Treasurer. Sealed tenders for each contract, in separate envelopes, addressed to the "Chairman of the Highway and Sewerage Committee," and endorsed "Tender for Stores," are to be delivered at office of Mr. E. George Mawbey, M.Inst.C.E., Borough Engineer and Surveyor, Borough Surveyor's Office, Town Hall, Leicester, not later than December 5.

DECEMBER 5.—**Leicester.**—ROAD MATERIALS.—Leicester Corporation invite tenders for the supply of granite kerb, setts, randoms, ringsmall, rammel, spallings, chippings, gravel, etc.; also for Breedon gravel, etc., as may be ordered during the year 1907. Form of tender, etc., may be obtained on deposit of 10s. Cheques, etc., should be made payable to the Borough Treasurer. Tenders and samples are to be delivered at office of Mr. E. George Mawbey, M.Inst.C.E., Borough Engineer and Surveyor, Borough Surveyor's Office, Town Hall, Leicester, not later than December 5, addressed to the "Chairman of the Highway and Sewerage Committee," and endorsed "Tender for Granite."

DECEMBER 5.—**Watford.**—SEWER PIPES.—Watford U.D.C. invite tenders for the supply of about 1,750 lineal yds. of earthenware or stoneware sewer pipes 15 in. in diameter; 1,100 lineal yds. of earthenware or stoneware sewer pipes 9 in. in diameter. Specification and form of tender may be obtained at the Engineer's office, at No. 14, High-street, Watford. Sealed tenders, on the form supplied, addressed to the Clerk to the Council, and endorsed "Tender for Sewer Pipes," are to be delivered, with samples of the pipes, not later than December 5.

DECEMBER 12.—**Dublin.**—SETTS AND STONES.—The Dublin Port and Docks Board invite tenders for supply of the undermentioned articles, from January 1 next to December 31, 1907:—Paving setts and broken stones. Securities will be required. Sealed tenders, addressed to Mr. N. Proud, Secretary, Port and Docks Office, Westmoreland-street, Dublin, and endorsed on the outside "Tenders for Paving Setts and Broken Stones," will be received up to December 12.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SURVEYOR AND INSPECTOR OF NUISANCES	Hale U.D.C.	180l.	Dec. 3
*GANGER	Kingston Borough Council	2l.	Dec 7

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD BUILDING LAND—At the Torrington Hotel, North Finchley	C. Sparrow & Son	Nov. 26
*FREEHOLD RESIDENCE, 27, WOOD-STREET, WOOLWICH—At the Mart	Furbers	Nov. 28
*BUILD. MATERIALS & CONTRACTOR'S PLANT, NEW SOUTHGATE—On the Premises	Gilbert & How	do.
*DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	do.
*BUILDING SITE (TO LET), LOWER THAMES-STREET—At the Mart	S. Walker & Son	Dec. 2
*FREEHOLD BUILDING SITE, KENNINGTON—At the Mart	Perkins & Cæsar	Dec. 7

PATENTS.—*Continued from page* 611.

deposited upon it. This lever-handle may be provided with ratchet-like teeth to regulate the amount of opening of said plate, and two or more plates may be used if necessary. The discharge plate may be arranged in any slanting position relatively to the arched recess of the boiler so that the ashes may slide down the same and be released periodically at the end of the slide by the withdrawal of slide or hinged flap.

7,545 of 1906.—W. J. PITT: *Means for Working and Operating Reversible Sliding Windows.*

This relates to connecting-rods fastened to vertical operating screws for reversible sliding windows, parallel sliding beams for reversible sliding windows, connected by cross strips at the back and provided with brackets with inclined slots working on fixed pins.

7,766 of 1906.—A. BROWN and H. C. PRUCE: *Manufacture or Production of a Certain Part of Door Furniture.*

This relates to the manufacture of split rings for securing door and other knobs to their spindles, and consists in making each of the halves by cutting off short lengths from solid bar or rod metal of trough-like section which are subsequently machined or milled to the required shape.

18,806 of 1905.—DR. W. SCHUMACHER: *Manufacture of Artificial Stone from Slag.*

This relates to the manufacture of artificial stone from slag wherein the slag is first subjected to a course and disintegrating process, and after being heated by steam with or without a small admixture of lime but without admixture of other silicious material, is subjected to pressure for producing blocks which are ready for use within a short time after their production.

3,779 of 1906.—T. THOMPSON: *Iron or Steel Roofing.*

This relates to iron or steel roofing, and consists in clipping the purlins or stretchers supported at their ends on the principals or roof supports by means of a T-iron, angle-iron, or equivalent clip, having an integral flange passing under the bottom or back of the principal or roof support, the whole being fixed together by bolts or rivets.

6,185 of 1906.—F. ANDE: *Hydraulic Presses.*

This relates to a device for regulating the movement of the ram in high-speed hydraulic presses driven direct by slowly-acting pumps, and is characterised by a suction-valve alone or together with a discharge-valve being opened for a certain time by the driving-gear pump, after a certain portion of the stroke, or after a given number of strokes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 7.—By E. L. GARDENER (at Canterbury).

Canterbury.—7, The Parade, and 9 and 9A Mercery-la. (s.), f., y.r. 130l.	£3,050
10, Mercery-la. (s.), f., y.r. 60l.	1,250
Old Dover-rd., "The Elms," and 3 a. 2 r. 37 p., f., y.r. 120l.	2,250

By BELLAMY & CO. (at Putney).

Putney.—6, Ulva-rd., u.t. 65 yrs., g.r. 12l., e.r. 75l.	530

November 8.—By FULLER, MOON, & FULLER (at Croydon).

Croydon.—216, London-rd., f. v.r. 60l.	1,100
142, 144, and 146, Brighton-rd., f., y.r., and e.r. 102l.	1,200
Ewell, Surrey.—London-rd., "Kiln House," y.r. 25l.; also 4 Kiln-cottages, w.r. 14l. 6s., f.	425

November 12.—By WM. HOUGHTON.

Walthamstow.—78, 80, and 82, Waverley-rd., f., w.r. 62l. 8s.	440
1 to 4, Waverley-av., and 70, Waverley-rd., f., w.r. 102l. 16s.	660
35 and 43, Northcote-rd., u.t. 69½ yrs., g.r. 12l. 12s., w.r. 67l. 12s.	585

By R. W. MANN & SON.

Putney.—89, Felsham-rd., u.t. 45 yrs., g.r. 5l., y.r. 36l.	225

By REBBECK BROS. (at Bournemouth).

Bournemouth, Hants.—Poole-rd., "Littleburn" and "Westwood Ville," with stabling, area half an acre, f., p.	3,850
West Hill-rd., "Eldon Lodge," u.t. 64½ yrs., g.r. 8l. 8s., y.r. 110l.	1,325

November 13.—By BROWETT & TAYLOR.

Bromley, Kent.—76A and 78, College-rd. (s.), with stabling, u.t. 94 yrs., g.r. 20l., y.r. 122l.	1,250
103 and 104, High-st. (s.), with workshop, yard, and stabling, part freehold and part u.t. 70½ yrs., g.r. 40l., y.r. 160l.	1,420

By DEBENHAM, TEWSON, & CO.

Notting Hill.—134, Ladbrook-gr. (s.), u.t. 57 yrs., g.r., 12l., p.	775
St. Leonard's-on-Sea, Sussex.—72, Warrior-sq., u.t. 65 yrs., g.r. etc. 19l. 7s., y.r. 80l.	300

By DRIVERS'.

Holloway.—297, Camden-rd., u.t. 40 yrs., g.r. 4l., e.r. 60l.	590

By SIMPSON & MOORE.

Eltham, Kent.—9, The-gr., u.t. 38 yrs., g.r. nil, e.r. 30l.	305

By HOLCOMBE, BETTS, & WEST.

Fulham.—Cristowe-rd., f.g. rents 112l., reversion in 77 yrs.	£2,800
Foskett-rd., f.g. rents 60l., reversion in 79 yrs.	1,505
New King's-rd., f.g.r. 58l., reversion in 75 yrs.	1,400
Ashington-rd., f.g.r. 11l., reversion in 77 yrs.	285
10, Cristowe-rd., f., y.r. 33l.	400
10 to 18 (even), Landridge-rd., u.t. 71¼ yrs., g.r. 10l., y.r. 184l.	1,955

November 14.—By R. LYNE FREEMAN.

Holloway.—122, Marlborough-rd., u.t. 48 yrs., g.r. 5l., w.r. 44l. 4s.	230
97 and 109, Sussex-rd., u.t. 45 yrs., g.r. 12l. 12s., y.r. 72l.	505
Islington.—188 and 190, Downham-rd., and 20A, Oxford-rd., u.t. 33 yrs., g.r. 10l., y.r. 91l. 12s.	570
Stoke Newington.—20, Defoe-rd., u.t. 58 yrs., g.r. 6l., y.r. 32l.	280
Holloway.—39, Magdala-rd., u.t. 65½ yrs., g.r. 4l., w.r. 31l. 4s.	120

By HAROLD GRIFFIN.

Wimbledon.—178, Queen's-rd., f., y.r. 45l.	650
Mitcham.—1 and 2, Zion-mount, f., w.r. 52l. 14s.	450

By HOBSON, RICHARDS, & CO.

Stamford-hill.—Egerton-rd., a plot of building land, f.	215
Egerton-rd., a block of building land, 1 a. 3 r. 12 p., f.	2,525

By MILLAR, SON, & CO.

Harpenden, Herts.—Tennyson-rd., "Slieve Coloun," f., p.	500

November 15.—By H. J. BLISS & SONS.

Shoreditch.—163, High-st., (s.), and 24, Anning-st., f., y.r. 150l.	2,600
Mile End.—63 to 69 (odd), Diggon-st., u.t. 38½ yrs., g.r. 14l., w.r. 145l. 12s.	730
19 to 29, Commodore-st., u.t. 63½ yrs., g.r. 44l., w.r. 371l. 16s.	2,070
Hackney.—20, 28, 46, 48, 50, 58, 60, and 62, Treadaway-st., f., w.r. 215l. 16s.	1,600
42, 44, 46, 48, 64, and 66, Temple-st., f., w.r. 180l. 14s.	1,280

By JOHNSON, DYMOND, & CO.

Bow.—6 and 26, Tredegar-rd., u.t. 62 yrs., g.r 12l.	485
90 and 130, Tredegar-rd., u.t. 41 yrs., g.r. 5l. 2s. 6d.	440
56, Malmesbury-rd., u.t. 65½ yrs., g.r. 4l.	250
130, 143, and 145, Malmesbury-rd., u.t. 40 yrs., g.r. 11l. 6s. 6d.	620
14, Lacey-st., u.t. 51 yrs., g.r. 4l.	205
11, St. Stephen's-rd., u.t. 47 yrs., g.r. 5l. 5s., y.r. 35l.	300
39, Alfred-st., u.t. 40 yrs., g.r. 5l.	225
10, Selwyn-rd., u.t. 37½ yrs., g.r. 4l. 4s.	215
Finsbury Park.—162, Tollington-pk., u.t. 37 yrs., g.r. 7l., y.r. 65l.	485
Hackney.—323 and 325, Victoria Park-rd., u.t. 32 yrs., g.r. 8l. 8s.	330
24, Brookfield-rd., f., y.r. 32l.	340

By F. J. COLEPEPER & CO.

Forest Hill.—23, Stillness-rd., u.t. 90¼ yrs., g.r. 7l., e.r. 34l. £340

By HUMPHREYS, SKITT, & HUMPHREYS.

Southend, Essex.—Lydford-rd., f.g. rents 40l., reversion in 80 yrs. 910

By LACEY, SCOTT, & SONS.

Sydenham.—56, Kirkdale (s.), f., y.r. 80l. 970

By STIMSON & SONS.

Bromley-by-Bow.—32, Cobden-st., f. 265

Brixton.—7, St. John's-rd., u.t. 48 yrs., g.r. 12l., e.r. 75l. 565

Battersea.—70, 72, and 74, Battersea Rise, area 6,000 ft., f., p. 1,080

Clapham.—104, Bedford-rd., u.t. 55½ yrs., g.r. 8l. 10s., y.r. 36l. 380

Dulwich.—Underhill-rd., "Honor Oak Mansions" (flats), f., w.r. 314l. 12s. 1,520

56, Beauval-rd., f., y.r. 32l. 440

Victoria Park.—254 and 256, Wick-rd., and 257, Cassland-rd., u.t. 49 yrs., g.r. 8l. 10s., y.r. 58l. 510

Hoxton.—10 and 12, Wenlock-st., u.t. 35½ yrs., g.r. 10l. 14s. 8d., y.r. 80l. 540

Notting Hill.—11 and 13, Crescent-st. (with laundry, stabling, etc.), f., p. 730

Tooting.—122 and 124, Upper Tooting-rd. (s.), u.t. 90 yrs., g.r. 21l., y.r. 205l. 2,580

Mottingham.—3 and 4, Hurndall Cottages, u.t. 999 yrs., g.r. 8l. 5s., w.r. 49l. 8s. 320

November 16.—HAMPTON & SONS.

Wimbledon Common.—6 and 10, Parkside-av.; also "Oldfield," "The Study," "Leewood," and "Sidmouth," f., y.r. 820l. 13,450

Calonne-rd., "Malling," u.t. 99 yrs., g.r. 30l., y.r. 150l. 1,750

By RIDER & SONS.

Notting Hill.—212, Walmer-rd., and 31, Threshers-pl., u.t. 23 yrs., g.r. 2l., w.r. 45l. 10s. 140

35, 35A, 35B, 37, and 39, Tobin-st., u.t. 23 yrs., g.r. 7l., w.r. 112l. 9s. 190

By SALTER, REX, & CO.

Camden Town.—71, Albert-st., u.t. 35 yrs., g.r. 2l. 10s., y.r. 50l. 415

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold, p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

TO CORRESPONDENTS.

"Tiler" (reduce the inches to decimals of a foot, and multiply).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

MEETINGS.

FRIDAY, NOVEMBER 23.

Royal Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. P. Manby on "The Laws, By-Laws, and Regulations Affecting the Inspection and Sale of Meat and other Articles of Food, including their Preparation and Adulteration." 7 p.m.

MONDAY, NOVEMBER 26.

University of London (Imperial Institute-road).—Mr. Banister Fletcher on "The Parthenon." 8 p.m.

Surveyors' Institution.—Paper by Mr. R. H. Blake entitled "Some Notes on Sanitary Law." 8 p.m.

Incorporated Institute of British Decorators (Painter-Stayners' Hall, Little Trinity-lane.)—Gold medal of the Institute to be presented to Sir William B. Richmond, K.C.B., R.A. 8 p.m.

TUESDAY, NOVEMBER 27.

Northern Architectural Association.—Mr. S. Addison Smith on "Sanitation," I. 7.30 p.m.

Institution of Civil Engineers.—(1) "The Talla Water Supply of the Edinburgh and District Waterworks," by Mr. W. A. P. Tait, B.Sc.; (2) "Repairing a Limestone Concrete Aqueduct," by Mr. M. Ratcliffe Barnett; (3) "The Yield of Catchment Areas," by Mr. E. P. Hill, M.Inst.C.E. 8 p.m.

WEDNESDAY, NOVEMBER 28.

Edinburgh Architectural Association (Associates' Meeting).—Mr. Nichol Selkirk on "Building Stones." 8 p.m.

Society of Arts.—Mr. John William Gordon on "Patent Law Reform." Sir William H. Preece, K.C.B., F.R.S., will preside. 8 p.m.

Northern Polytechnic Building Students' Association.—Mr. Hugh Stannus on "The Beginnings of Building." 7.30 p.m.

Institution of Civil Engineers (Students' Visit).—Evening Inspection of the Great Northern, Piccadilly, and Brompton Railway. Assemble at the Piccadilly Circus Station of the Railway at 8 p.m.

FRIDAY, NOVEMBER 30.

Architectural Association.—Mr. W. Woodward on "The Difficulties which beset an Architect in London, with special regard to existing Legislation and other controlling Authorities." 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. Bowman on "Modern Buildings with Steel Construction." 8 p.m.

Institution of Mechanical Engineers.—An Extra Meeting at 8 p.m., when the discussion will be continued on "Steam as a Motive Power for Public Service Vehicles," by Mr. Thomas Clarkson.

Institution of Civil Engineers (Students' Meeting).—Mr. P. A. Spalding, Stud.Inst.C.E., on "Applications of Electricity in Printing Works." 8 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 10 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 7 0	" " "
Picked Stocks for Facings	2 17 6	" delivered.
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	27 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super., "
6 in. rubbed two sides ditto	3 0	" "

STONE (*continued*).

	s. d.	
HARD YORK (*continued*)—		
3 in. sawn two sides slabs (random sizes)	1 3	per ft. super. deld. rly. depôt.
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 0	per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. sawn both sides random slabs	1 0	" "
" " " 2 in. do.	0 8½	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42	0 per 1000 at rly. depôt.
Hip and Valley tiles	3	7 per doz. "
Best Broseley tiles	50	0 per 1000 "
Do. Ornamental tiles	52	6 " "
Hip and Valley tiles	4	0 per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57	6 " "
Do. Ornamental do.	60	0 " "
Hip tiles	4	0 per doz. "
Valley tiles	3	0 " "
Best Red or Mottled Staffordshire do. (Peakes)	51	9 per 1000 "
Do. Ornamental do.	54	6 " "
Hip tiles	4	1 per doz. "
Valley tiles	3	8 " "
Best "Rosemary" brand plain tiles	48	0 per 1000 "
Best Ornamental tiles	50	0 " "
Hip tiles	4	0 per doz. "
Valley tiles	3	8 " "
Best "Hartshill" brand plain tiles, sand-faced	50	0 per 1000 "
Do. pressed	47	6 " "
Do. Ornamental do.	50	0 " "
Hip tiles	4	0 per doz. "
Valley tiles	3	6 " "

WOOD.

BUILDERS' WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0
JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	... 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	... 18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	... 20 0 0
" 3 in. by 9 in.	17 10 0	... 19 0 0
" Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	... 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	... 22 10 0
Do. 3 in. by 9 in.	18 0 0	... 19 10 0
Battens	13 10 0	... 15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	... 17 0 0
Do. 3 in. by 9 in.	14 10 0	... 16 0 0
Battens	11 0 0	... 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	... 14 0 0
Do. 3 in. by 9 in.	12 10 0	... 14 0 0
Battens	10 0 0	... 11 0 0
White Sea and Petersburg—		
First white deals, 3 in. by 11 in.	14 10 0	... 15 10 0
" " 3 in. by 9 in.	13 10 0	... 14 10 0
Battens	11 0 0	... 12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	... 14 10 0
" " 3 in. by 9 in.	12 10 0	... 13 10 0
" " battens	10 0 0	... 11 0 0
Pitch-pine: deals	18 0 0	... 21 0 0
Under 2 in. thick extra	0 10 0	... 1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Yellow Pine oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	... 0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 3 0	... 0 3 6
Small " "	0 2 6	... 0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	... 0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	... 0 0 9½
¾ in. do. do	0 0 7	... —

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.	£ s. d.
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. " "	0 14 0	0 18 0
¾ in. by 7 in. white " "	0 10 0	0 11 6
1 in. by 7 in. " "	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 5 0	7 15 0
Compound Girders, ordinary sections	9 10 0	10 10 0
Steel Compound Stanchions	12 5 0	13 5 0
Angles, Tees, and Channels, ordinary sections	9 5 0	10 5 0
Flitch Plates	9 5 0	10 5 0
Cast Iron Columns and Stanchions including ordinary patterns	8 0 0	9 0 0

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 10 0	9 0 0
Staffordshire Crown Bars, good merchant quality	9 0 0	9 10 0
Staffordshire "Marked Bars"	11 0 0	—
Mild Steel Bars	9 5 0	9 10 0
Hoop Iron, basis price	9 10 0	9 15 0
" " Galvanised	17 10 0	—
("And upwards, according to size and gauge.)		
Sheet Iron Black—		
Ordinary sizes to 20 g.	10 0 0	—
" " 24 g.	11 0 0	—
" " 26 g.	12 10 0	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 8 ft. to 20 g.	14 10 0	—
Ordinary sizes to 22 g. and 24 g.	15 0 0	—
" " 26 g.	15 10 0	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	17 10 0	—
" " 22 g. and 24 g.	18 0 0	—
" " 26 g.	19 10 0	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	14 10 0	—
" " 22 g. and 24 g.	14 15 0	—
" " 26 g.	16 0 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	—
" " 26 g.	15 0 0	—
Cut Nails, 3 in. to 6 in.	10 0 0	10 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up.	21 15 0	—
Pipe in coils	22 5 0	—
Soil pipe	24 15 0	—
Compo pipe	24 15 0	—
ZINC—Sheet—		
Vieille Montagne ton	34 0 0	—
Silesian	33 15 0	—
COPPER—		
Strong Sheet per lb.	0 1 4	—
Thin "	0 1 5	—
Copper nails "	0 1 3	—
BRASS—		
Strong Sheet "	0 1 2	—
Thin "	0 1 3	—
TIN—English Ingots "	0 1 11	—
SOLDER—Plumbers' "	0 0 9	—
Tinmen's "	0 0 11½	—
Blowpipe "	0 1 1	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1½d. " "
21 oz. thirds	3½d. " "
" fourths	2½d. " "
26 oz. thirds	4½d. " "
" fourths	3½d. " "
32 oz. thirds	5d. " "
" fourths	4½d. " "
Fluted Sheet, 15 oz.	3½d. " "
" 21 oz.	4½d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

Hartley's	2½d. per ft. delivered.
"	2½d. " "
"	3d. " "
Figured and Oxford Rolled "Oceanic" Glass, white	4d. " "
Do. " tinted	5½d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 10
" " " in barrels	"	0 1 11
" " " in drums	"	0 2 1
Boiled " " in pipes	"	0 2 0
" " " in barrels	"	0 2 1
" " " in drums	"	0 2 3
Turpentine in barrels	"	0 4 0
" in drums	"	0 4 2

OILS, &c. (*continued*).

		£ s. d.
Genuine Ground English White Lead	per ton	25 0 0
Red Lead, Dry	"	24 0 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 6
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BOLTON-UPON-DEARNE.—For the construction of stoneware pipe sewers &c., for the Urban District Council. Mr. W. H. Radford, C.E., Albion-chambers, King-street, Nottingham:—

	Tender No. 1.	Tender No. 2.
Greaves & Wheater	£9,200 0 0	£9,200 0 0
Allott, Cook, & Heywood	8,100 0 0	8,060 0 0
Gates & Hogg	8,041 16 5	7,943 19 11
S. C. Boul	7,819 4 6	7,902 0 0
Edmondson & Wyatt	7,685 0 0	7,666 16 0
S. Hamilton	7,640 0 0	7,940 0 0
Jowett Bros.	7,286 18 0	7,412 0 6
Jones Bros.	7,200 0 0	7,375 0 0
J. Cooper	7,070 9 2	7,418 10 8
J. Moran	7,050 0 0	7,050 0 0
I. Dean & Co.	6,995 0 0	7,300 0 0
Parker & Sharp	6,778 11 10	7,007 19 9
W. Johnson	6,719 0 0	6,719 0 0
W. Thordton & Son	6,689 0 0	6,670 0 0
J. C. Moffatt	6,622 15 7	6,998 14 0
A. J. Cottle	6,600 0 0	6,722 10 0
J. MacKay	6,599 0 5	6,541 0 2
E. Taylor	6,480 6 10	6,630 19 4
Fletcher, Hann, Fletcher	6,459 17 3	6,459 17 3
R. W. Blackwell & Co., Ltd.	6,433 2 11	6,447 3 6
E. Bentley & Sons	6,377 7 9	6,468 7 9
J. H. Wood	6,375 0 0	6,425 0 0
W. H. Hill	6,340 0 0	6,394 0 0
B. Firth & Co.	6,338 12 0	6,265 16 0
Ward & Tetley	6,195 0 0	6,247 6 6
G. W. Meanley	6,138 0 0	6,429 4 0
Wm. Brigg	6,100 0 9	6,150 0 0
Bower Bros.	6,065 0 0	6,065 0 0
A. Braithwaite	6,045 6 4	6,113 11 4
Lock, Andrews, & Price	5,987 15 6	6,133 7 6
E. Rothera	5,943 17 4	6,314 5 4
G. Clements	5,900 0 0	5,842 0 0
W. Waring & Sons	5,857 8 10	5,893 16 10
W. Craig	5,831 0 0	5,831 0 0
R. Holmes & Sons	5,800 0 0	5,840 0 0
T. Morrison	5,780 0 0	5,770 0 0
Beighton & Berry	5,709 10 8	5,716 13 0
W. Morley & Sons	5,631 12 10½	5,631 12 10½
H. H. Barry	5,600 0 0	5 675 0 0
G. MacKay & Son	5,577 17 0	5,627 0 0
J. W. Dean, Ltd.	5,474 14 8	5,544 14 8
H. E. Buckley 107, Swan-arcade, Bradford, Yorks*	5 404 5 9	5,384 17 3
J. W. Broadhead	5,100 0 0	5,100 0 0

CHIPPING WYCOMBE.—For a refuse destructor for the Corporation. Mr. I. J. Rushbrook, Borough Surveyor and Waterworks Engineer, 77, Easton-street, High Wycombe:—

Goddard, Massey, & Warner‡	£3,786 16
Manlove, Alliott, & Co.	3,344 0
Heenan & Froude	2,699 0
Hughes & Sterling	2,611 0
Horsfall & Co.	2,252 0
Meldrum Bros., Manchester*	2,180 0

[Acceped tender amended to include buildings, £3,842.]

‡ Including buildings.

COLCHESTER.—For the foundation of the main building of the new Second Asylum to be erected at Mile End, for the Essex County Council. Quantities by Messrs. R. L. Curtis & Son, 11 and 12, Finsbury-square, E.C. Messrs. F. Whitmore, County Architect, and W. H. Town, A.R.I.B.A., 4, Duke-street, Chelmsford:—

Foundations.

S. Redhouse, sen.	£29,301 11 6	Foster & Dickson	£21,823 0 0
R. Lock	28,494 15 4	J. Moffatt	21,721 13 7
J. & T. Binn	26,849 4 11	W. Cunliffe	21,675 0 0
G. Double	26,595 1 8	Johnson & Co.	21,622 0 0
J. H. Macdonald	26,146 0 0	T. Rowbotham	21,620 0 0
Perry & Co.	25,989 0 0	Kerridge & Shaw	21,593 0 0
C. G. Hill	25,600 0 0	Facey & Son	21,577 2 3
W. Chambers	25,599 0 0	Parnell & Co.	21,499 0 0
Potter & Co.	25,800 0 0	Leslie & Co., Ltd.	21,328 0 0
Davies, Ball, & Co.	25,062 0 0	Wilson & Sons	21,229 18 4
Pedrette & Co.	25,000 0 0	Spencer, Santo & Co.	21,200 0 0
Kirk & Randall	24,700 0 0	Parkington & Son	21,000 0 0
Bowen & Sons	24,567 0 0	Moran & Son	20,995 0 0
S. A. Kenney	24,551 0 0	Lowe & Son	20,990 0 0
Allen & Sons	24,500 0 0	Hawkins & Co.	20,938 0 0
Everett & Son	24,350 0 0	F. G. Minter	20,888 0 0
Higgs & Hill	24,124 0 0	Grimwood & Sons	20,877 0 0
H. Watson	24,000 0 0	Armitage & Hodgson	20,836 0 0
Bell & Sons	23,595 0 0	F. & E. Davey	20,587 0 0
McCormick & Sons	23,456 0 0	Wood & Sons	20,234 4 9
Willcock & Co.	23,378 0 0	F. Bennett	20,230 0 0
Jackson & Co.	23,168 0 0	Moss & Co.	20,154 0 0
F. Evans	23,000 0 0	Pethick & Co.	19,977 0 0
W. Manders	22,949 0 0	Hunt & Co.	19,943 0 0
Kerr & Co.	22,781 1 4	W. Willett	19,750 0 0
Youngs & Sons	22,750 0 0	Hammond & Sons	19,563 0 0
Lovatt, Ltd.	22,697 0 0	F. & A. Willmott	19,544 0 0
Neal & Co.	22 684 18 10	Oak Building Co.	19,394 0 0
A. N. Coles	22,567 0 0	Muirhead & Co.	19,299 0 0
Blackwell & Co.	22,340 11 9	King & Son	19,080 0 0
C. Wall, Ltd.	22,329 0 0	F. C. Thurman	18,999 0 0
Wallis & Sons	22,200 0 0	Chessum & Son*	18,939 0 0
Harris & Sons	21,200 0 0		
Godson & Sons	21,987 0 0		
Grimwood & Sons	21,850 0 0		
Zadiz & Co.	21,842 0 0		

ERITH.—For the deepening and repair of brick steined well in Electricity Works yard, High-street, for the Urban District Council. Messrs. Hawtayne & Zeden, consulting engineers, 9, Queen-street-place, E.C.:—

G. Eastell & Son	£740 0 0	T. Tilley & Son	£280 0 0
R. D. Batchelor	580 8 5	A. E. Nunn, Finsbury House, E.C.*	210 0 0
J. Sangwin	362 10 0		
W. Brown & Son	305 0 0		

EVESHAM.—For stoneware pipe sewers (Badsey Sewerage), for the Rural District Council. Messrs. Willcox & Raikes, engineers, 65, Temple-row, Birmingham:—

Byard & Sons	£3,030 0 0	J. H. Macdonald	£2,108 0 0
Sutherland & Thorpe	2,800 0 0	Meredith Bros.	2,088 10 0
J. Moffatt	2,610 7 3	Chick, Carden, & Co.	2,085 2 8
J. Roberts	2,600 0 0	G. J. Morgan	2,054 19 0
Blackwell & Co., Ltd.	2,325 12 5	J. A. Meredith	2,025 0 0
Loch, Andrews, & Price	2,309 13 11	Rowell & Sons	2,021 7 11
T. J. Mason	2,303 0 0	Morley & Sons	2,018 15 9
A. Jewell	2,290 0 0	W. H. Reading	2,000 0 0
W. Cunliffe	2,250 0 0	J. & A. Crozier	2,000 0 0
Pollard & Co.	2,229 10 5	Hewett & Sons	1,999 19 9
A. J. Cottle	2,215 5 9	J. Kinson Bros.	1,993 0 0
Currall, Lowis, & Martin	2,154 0 0	Vale & Sons, Ltd., Stockport*	1,981 0 0
G. G. Rayner	2,135 0 0	T. Egan & Sons	1,962 2 0
J. E. White	2,115 0 0	W. Westwood	1,937 13 0
H. E. Buckley	2,109 13 7	W. Wheeler	1,876 13 8

HAILSHAM.—For sewerage works, Polegate, for the Rural District Council. Mr. W. Dunbar, C.E., 12a, Portsmouth-road, Guildford. Quantities by engineer, 12a, Portsmouth-road, Guildford:—

A. C. Soan	£615 3 7	Wallis & Co.	£390 0 0
Miller & Selmes	611 19 3	Peerless - Dennis & Co.	387 10 0
R. W. Swaker	491 3 5	W. Wood	372 10 2
J. Vine	469 1 5	H. Young	371 6 2
J. Carley	418 15 9	James & Co., Guildford*	309 0 0
Rose & Co.	400 13 7		
S. Carey	395 10 8		

HIGHWORTH (Wilts).—For alterations, etc., at the Saracen's Head Hotel. Messrs. Drew & Sons, architects, Regent Circus, Swindon:—

J. Lay	£325 0 0	Tydeman Bros., Swindon*	£219 7 6
H. & C. Spackman	280 0 0		
Chick, Carden & Co., Ltd.	275 0 0		

HORSHAM.—For extending the cloak-room accommodation to Horsham East-parade Council Schools, for the West Sussex Local Education Authority. Mr. C. H. Burstow, architect, 6, West-street, Horsham:—

Cropley & Sons	£474 0	Potter Bros.	£405 0
Rowland Bros.	434 0	H. Lindfield & Son	396 0
W. Randall & Sons	430 0	Hillman & Mussell, Horsham*	349 15
G. Potter	408 0		

HULL.—For erecting three shops in Jameson-street, for the Property Committee of the Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull:—

Hebble-white & Wilson	£2,853 0 0	M. Harper	£2,766 0 0
W. Sanderson	2,850 0 0	H. Tarnott	2,751 11 10
Simpson & Sons	2,850 0 0	Quibell, Son, & Greenwood	2,750 0 0
Jackson & Sons	2,790 0 0	G. H. Pantos	2,730 0 0
		G. Houlton & Sons	2,715 0 0
		T. Goates*	2,695 0 0

KENDAL.—For excavation and laying of land drains at Sewage Disposal Works, for the Corporation. Mr. F. W. Oxberry, Borough Surveyor, Town Hall, Kendal. Quantities by Borough Surveyor, Kendal:—

T. & W. Dirkin	£416 17 0	R. Woodburn*	£324 4 2
W. Carradice	380 12 3		

[All of Kendal.]

KING'S NORTON.—For making good of part of Franklin-road, for King's Norton and Northfield Urban District Council. Mr. A. W. Cross, Engineer and Surveyor, 23, Valentine-road, King's Heath:—

Currall, Lewis, & Martin, Ltd.	£1,243 8 10	J. White, jun.	£1,055 5 2
		R. Clarke, Sparkbrook*	970 0 0

LONDON.—For a new boiler at the Drury-lane Day Industrial School (Holborn), and the execution of the necessary builder's work in connexion therewith, for the London County Council:—

C. Kite & Co.	£250 0	H. C. Price, Lea, & Co.	£233 0
Turner & Co.	247 11	Comyn, Ching, & Co., Ltd., 54-58, Castle-street, Long-acre*	204 0
J. & F. May	247 0		
J. Fraser & Son, Ltd.	246 0		
R. H. & J. Pearson, Ltd.	243 0		

[These tenders include a provisional sum of £25 for executing builder's work. The estimate of the Architect (Education), comparable with the tenders, is £180.]

LONDON.—For the erection of a building for the accommodation of girls at Dawes-road Secondary School, Fulham, for the London County Council:—

Lathey Bros.	£32,142	W. King & Son	£28,524
Waring, White, Building Co., Ltd.	30,304	C. J. Kearley	28,315
		C. Wall, Ltd.	28,021
McCormick & Sons	30,270	J. Grover & Son	27,933
W. Downs	29,983	L. Whitehead & Co., Ltd.	27,865
Holloway Bros. (London), Ltd.	29,978	E. Lawrance & Sons	27,741
G. Godson & Sons	29,600	Treasure & Son	27,312
Spencer, Santo, & Co.	29,507	W. Johnson & Co., Ltd.	27,260
Leslie & Co., Ltd.	29,008	J. Garrett & Son	26,554
H. Lovatt, Ltd.	28,793	J. & M. Patrick, Point-pleasant, Wandsworth *,*	26,139
Patman & Fotheringham, Ltd.	28,683		

, Recommended for acceptance.

[The estimate of the architect (Education), comparable with the tenders, is £32,006.]

LONDON.—For additional plant for installation of additional electric plant at the Battersea, Brixton, Clapham, Streatham, and Wandsworth Sub-stations, and for the making of the necessary cable connexions, etc., for the London County Council:—

Four 500-kilowatt Motor Generators.

Dick, Kerr & Co., Ltd.	£8,677 0 0
British Westinghouse Electric & Manufacturing Co., Ltd., London*	7,588 7 6

LONDON.—For altering and adapting existing temporary building and completing superstructure of Shepherd's Bush Tabernacle, Shepherd's Bush-road, W., for the Building Committee. Mr. P. W. Hawkins, A.R.I.B.A., 28, Victoria-street, Westminster, S.W.:—

	Gross Tender.		Reduced Tender.
W. Nash	£5,093	....	£5,188
I. Whitehead & Co., Ltd.	4,970	....	4,370
C. Gray, Shepherd's Bush	4,750	....	4,001
Ferris Bros.	4,700	....	3,850

LONDON.—For the erection of a new police-station at Shadwell. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, & Chidgey, Charing-Cross-chambers, Duke-street, Adelphi, S.W.:—

C. Ansell	£13,750	Holloway Bros.	£12,858
H. Lovatt, Ltd.	13,132	Godson & Sons	12,632
Mowlem & Co., Ltd.	13,099	F. & H. F. Higgs	12,591
Clarke & Bracey	13,069	Grover & Son	12,483
Lathey Bros.	12,740	Patman & Fotheringham	12,433
Lascelles & Co.	12,715	Chessum & Sons	12,347
Dove Bros.	12,693	Lawrence & Sons	12,146
Kilby & Gayford	12,667		

LONDON.—For the erection of business premises, Turnham Green-terrace, Chiswick, W., for Mr. A. Royd. Messrs. Palgrave & Co., architects, 28, Victoria-street, S.W.:—

Thomas & Edge	£4,198	R. Ward & Son	£3,900
McLaughlin & Harvey	4,053	H. Smith & Son, Earl's Court*	3,585

NETHER ALDERLEY.—For alterations to Council school, for Macclesfield and Hayfield Education Sub-Committee. Mr. H. Beswick, County Architect, Chester. Quantities by Architect:—

R. Allen	£1,010	Boon & Fryer	£740
J. K. Coates	871	J. Massey & Sons, Alderley Edge*	690
G. Roylance & Co., Ltd.	806		

OLD CORNFORTH.—For erecting butchering premises, stabling, etc., for Cornforth Co-operative Society, Ltd. Mr. H. T. Gradon, architect, Market-place, Durham:—

Stockton Co-operative Society	£1,403 0 0	G. T. Manners	£1,319 0 0
		W. H. Ayton	1,300 0 0
Bell & Mann	1,400 12 1	Denby & Co.	1,293 0 0
T. Sanderson	1,389 10 0	T. Hilton	1,183 0 0
L. W. Rowe	1,388 13 9	J. Robson	1,160 0 0
W. Hall	1,361 9 10	Draper & Sons, Leamside*	1,150 0 0
D. Chambers	1,361 0 0		
T. Coates	1,324 0 0		

[Architect's estimate £1,200.]

STAVERTON.—For laying a new 6-in. sewer and building eight inspection pits at Landscove village, for Totnes Rural District Council. Mr. C. Ellis, surveyor, South Brent:—

W. Atwill, Broadhempston, Totnes £86 12

SWINDON.—For alterations at the Bakers Arms Beer-house Badbury. Messrs. Drew & Sons, architects, Regent Circus, Swindon:—

J. Lay, Swindon* £117 13 6

[Five Tenders received.]

WEMBLEY.—For making-up of Swinderby and part of Eagle-roads, for the Urban District Council. Mr. Cecil R. W. Chapman, Surveyor, Public Offices, Wembley:—

	Swinderby-road.	Eagle-road.
J. Mowlem & Co., Ltd.	£2,103 0 0	£453 0 0
F. G. Brummel	1,891 4 6	405 15 2
J. C. Trueman	1,887 0 0	409 0 0
F. Fowles	1,864 12 8	406 13 8
Davies, Ball, & Co.	1,852 6 1	401 19 9
H. Haynes	1,844 0 0	408 0 0
S. Gibbons	1,838 6 8	404 3 11
Bower Bros.	1,784 12 0	424 7 6
T. Adams	1,780 17 3	386 1 7
F. Tribe & Co.	1,671 9 10	377 8 6
W. & C. French	1,670 14 8	363 11 7
O. T. Gibbons*	1,654 14 8	376 6 0
T. Free & Sons	1,637 11 11	374 2 3

W. H. Lascelles & Co.

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